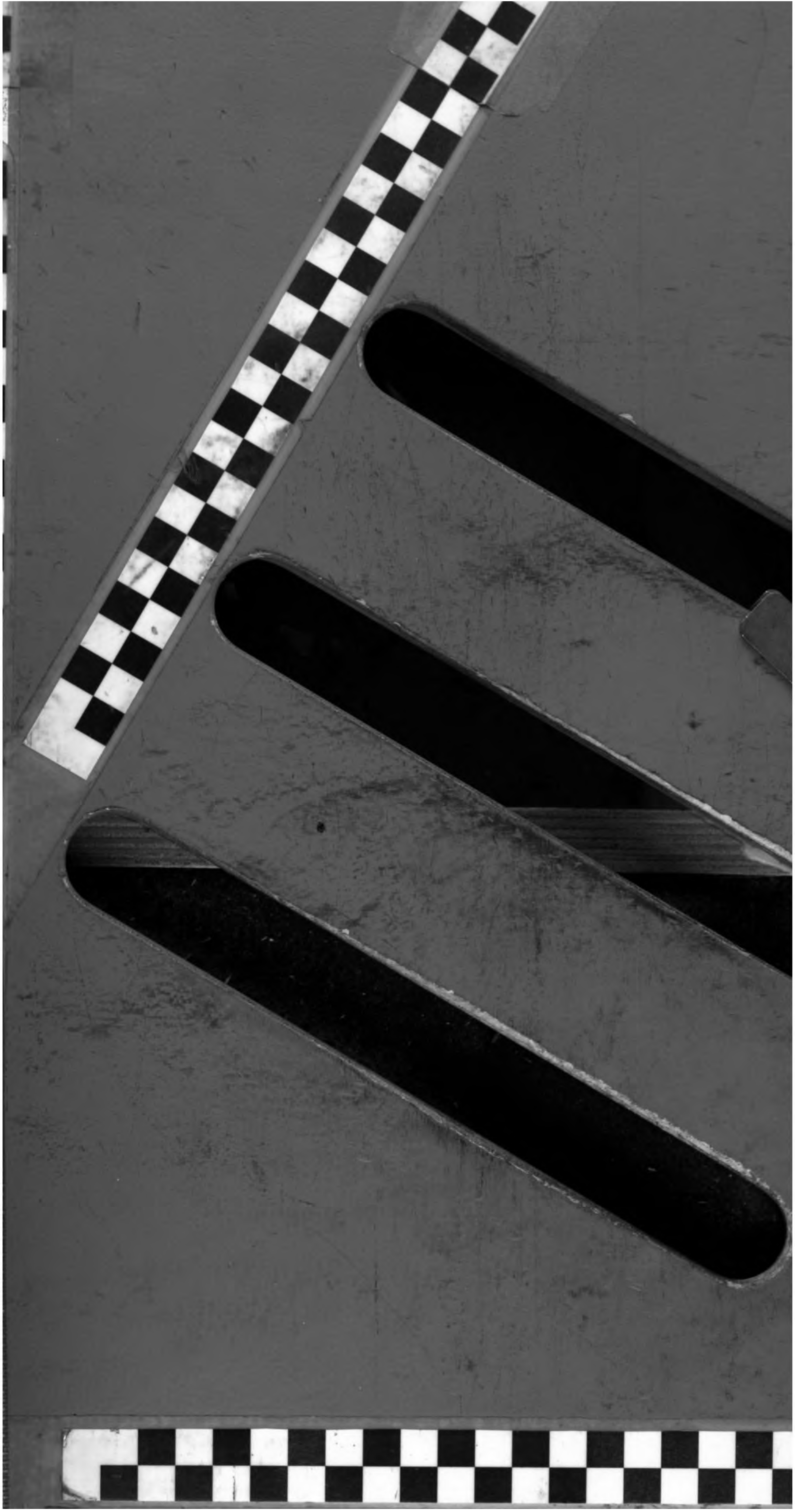

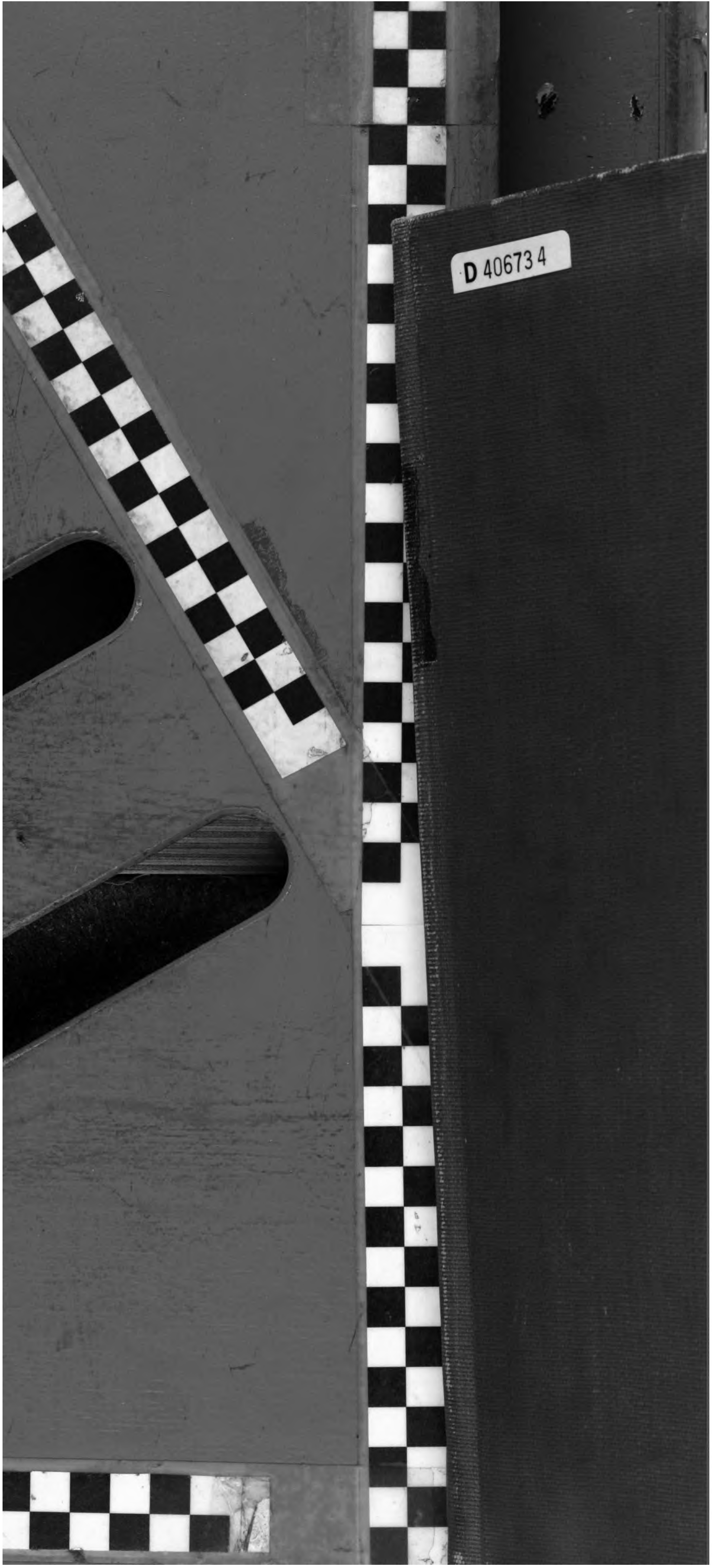
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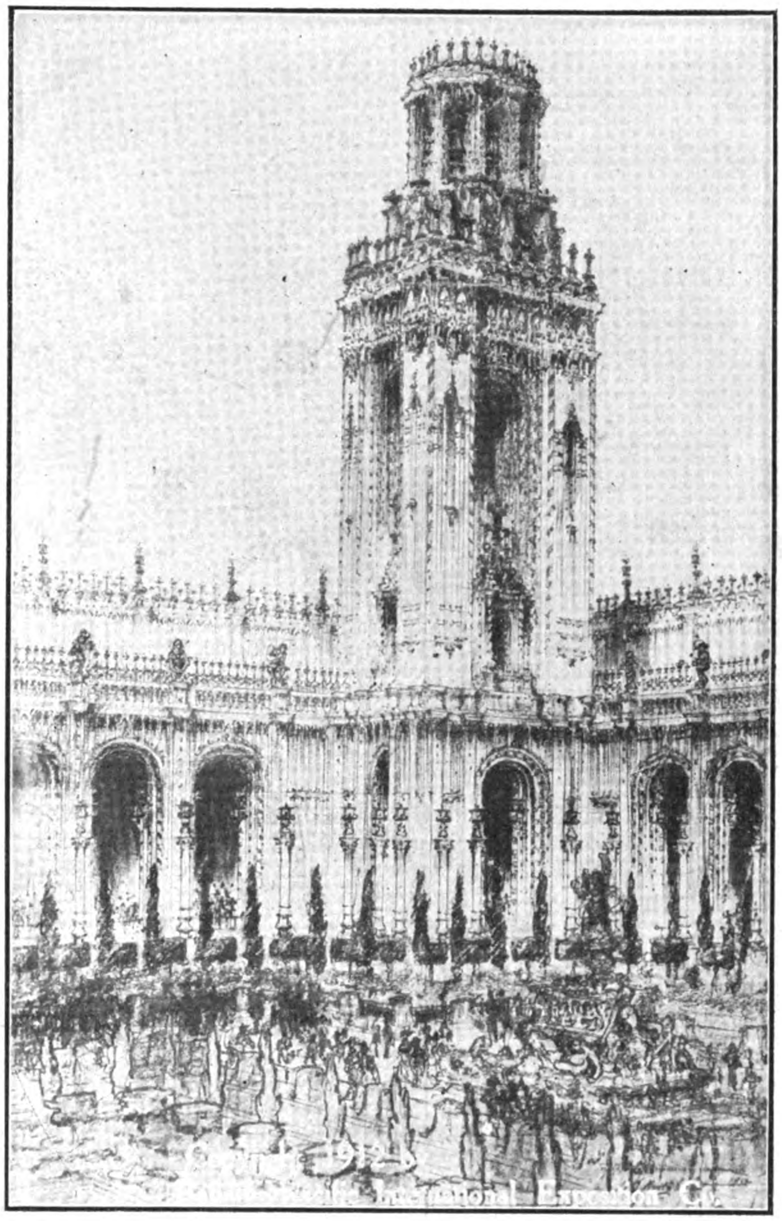
THE FAR EASTERN REVIEW

COMMERCE :-: ENGINEERING :-: FINANCE

VOL. X. SHANGHAI AND MANILA, JUNE 1913 No. 1

THE PANAMA-PACIFIC INTERNATIONAL EXPOSITION



THE PANAMA-PACIFIC INTERNATIONAL EXPOSITION.—An echo tower in the east or Festive Court at the Panama-Pacific International Exposition, San Francisco, 1915. At night the east court, with its pavements of gold, its great banks of flowers, and its lofty palms, will be flooded with light. The world's favorite melodies will be rendered by the chimes in the towers. Great saengerfests and choral festivals will be held upon the floors of the court.

On January 31, 1911, the Congress of the United States selected San Francisco as the most desirable site for the Nation's celebration of the formal opening of the Panama Canal, which has been set for January 1, 1915. On October 14, 1911, in the presence of over 100,000 people, the President of the United States, Hon. William Howard Taft, inaugurated the preparation of this great universal celebration by turning the first spadeful of earth at San Francisco for the Panama-Pacific International Exposition in 1915. On February 2, 1912, the President of the United States issued a Proclamation announcing the holding of the Panama-Pacific International Exposition, and inviting the nations of the world to take part on a scale befitting their dignity and importance.

This Exposition will open on Saturday, February 20, 1915, and close on Saturday, December 4, 1915, running from Winter to Winter, a period of nine and one-half months.

The capital stock originally issued was $5,000,000, divided into 500,000 shares of $10 each, but owing to the prompt and liberal manner in which subscriptions were made the stock was increased to $10,000,000.

To demonstrate appreciation of the honor conferred, and their ability to inaugurate, perfect, and operate an international Exposition of this magnitude, nearly three-fourths of this capital stock was subscribed by the citizens of San Francisco, but after weeding out all duplicated subscriptions and cancellations through death or other valid cause, the total sum remaining subscribed to October 1, 1912, was $6,095,350, of which amount $2,325,801.29 has actually been paid in to the Exposition. Besides the stock actually subscribed over the signatures of stockholders there are further sums pledged which aggregate $1,453,350 that are due to become a part of the general fund.

The State of California by legislative enactment appropriated $5,000,000; and the City of San Francisco issued bonds in the sum of $5,000,000. These appropriations and subscriptions, aggregating $17,500,000 in U. S. currency, form the general fund of the Panama-Pacific International Exposition Company for preparation and construction of the Exposition.

The Counties of California were authorized by the Legislature to levy a special tax upon themselves of a sum not to exceed six cents on the hundred dollars each year for five years, commencing with the year 1911. The proceeds are designed for individual participation by the other fifty-seven Counties of the State outside of San Francisco. It is expected that this fund will approximate $3,000,000.

In addition, large sums will be expended by Foreign Countries and the States, as well as by private exhibitors from the United States and abroad. The grand total will constitute an expenditure approximating $50,000,000.

A fair estimate of the Exposition collections shows that 38% out of a possible 45% of the subscribed stock had

been paid with very little solicitation. This is a remarkable showing when it is considered that these subscriptions are based on a five-year period, and the subscriber was permitted the option of electing whether he or she would pay their entire subscription at once, or annually, semi-annually, quarterly or monthly. In view of this fact the Exposition management fixed July 1, 1910, as the date when the first payment would be due.

When it is considered that previous American Expositions, with vigorous collection methods, have been able to collect only 90% of their subscriptions, and that the San Francisco Exposition has collected 90% with very little urging, it shows that subscriptions are coming in well.

Of the 14,000 subscribers to the Exposition fund, there are about 1,000 who have subscribed $5,500,000. These larger subscribers are all able to pay better than smaller subscribers of five, ten or fifteen dollars each, from whom it is not expected to gain the same excellent percentage of collections.

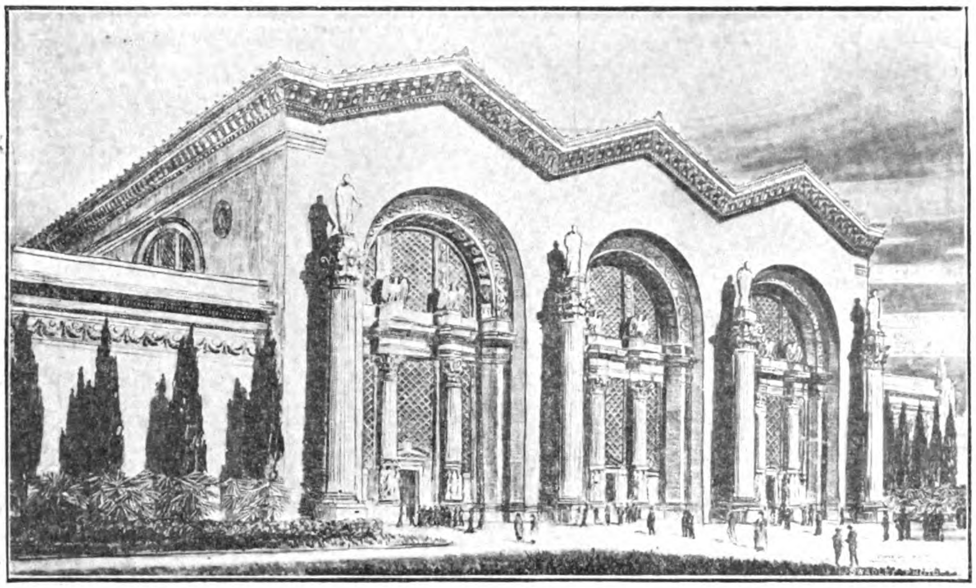
The local management of the Exposition is entrusted to a Board of Directors thoroughly representative of the trade, commerce, banking, manufacturing, professional and civic interests of San Francisco. These thirty Directors, fully recognizing the importance of their task and the vast responsibility it entails, are devoting their intelligence and best energies to the great undertaking.

All administrative branches and Executive Divisions and Departments of the Exposition are under the authority of the President of the Corporation. The members of the Executive Committee of the Corporation and the Comptroller of the Exposition constitute the Cabinet of the President. The Executive Staff of the President consists of a Director-in-Chief, a Director of Division of Exhibits, a Director of Division of Exploitation, a Director of Division of Works, and a Director of Division of Concessions and Admissions. Under these officers, subordinate Departments for the supervision of Exhibits, of Construction, and of Maintenance are provided for, each Department having its individual head or chief. Other Executive officers may, from time to time, be appointed by the President, subject to the approval of the Board of Directors.

The President of the Panama-Pacific International Exposition is CHARLES CADWELL MOORE, President of Chas. C. Moore & Co., Engineers (Incorporated). He is also a Director in the Anglo-California Trust Company, West Coast Life Insurance Company and the California Insurance Company.

The Director-in-Chief of the Exposition is Dr. Frederick J. V. Skiff, who is also Director of the great Field Museum at Chicago. Dr. Skiff is recognized as the world's leading Exposition authority, and his knowledge and experience in this important line of work commands the attention and respect of everyone. He was the Deputy Director-General of the World's Fair at Chicago in 1893, Director-in-Chief of United States exhibits at the Paris Exposition of 1900 and Director of Exhibits at the St. Louis World's Fair in 1904.

The Division of Works has charge of the construction and maintenance of the Buildings and Grounds of the Exposition. The Director of Works is Harris D. H. Connick, formerly Assistant City Engineer of San Francisco.



THE PANAMA-PACIFIC INTERNATIONAL EXPOSITION.—The imposing façade of Machinery Hall, the largest building at the Panama-Pacific International Exposition, San Francisco, 1915, now under construction. The structure will be 367.8 × 997.8 feet and will be decorated with more than a mile and half of ornamental cornices. The architectural design of the building is based upon the Roman arch motif, prototypes of which may be found in the big Roman baths at Hadrian and Caracalla. The interior arrangement consists of three naves 75 feet in width, 122 feet in height and more than 900 feet long.

The grounds of the Exposition comprise 625 acres in the Harbor View section, forming a natural amphitheatre overlooking San Francisco Bay and its "Golden Gate" entrance from the Pacific. These grounds include part of the United States military reservations —the "Presidio" on one end and "Fort Mason" at the other. They extend over two miles on the water front and are one-half mile wide, all being naturally picturesque, particularly receptive for artistic embellishment and in harmony with the sentiment underlying the great celebration. By July, 1914 —eight months before the Exposition opens—all of the main group of eleven great Exhibit Palaces will be completed.

By June, 1914, nine months before its gates will be opened the exhibits of the world can be rolled into the spacious halls of the Exhibit Palaces in the cars in which they were loaded in distant States and from the ships which have borne them from the ports of the world.

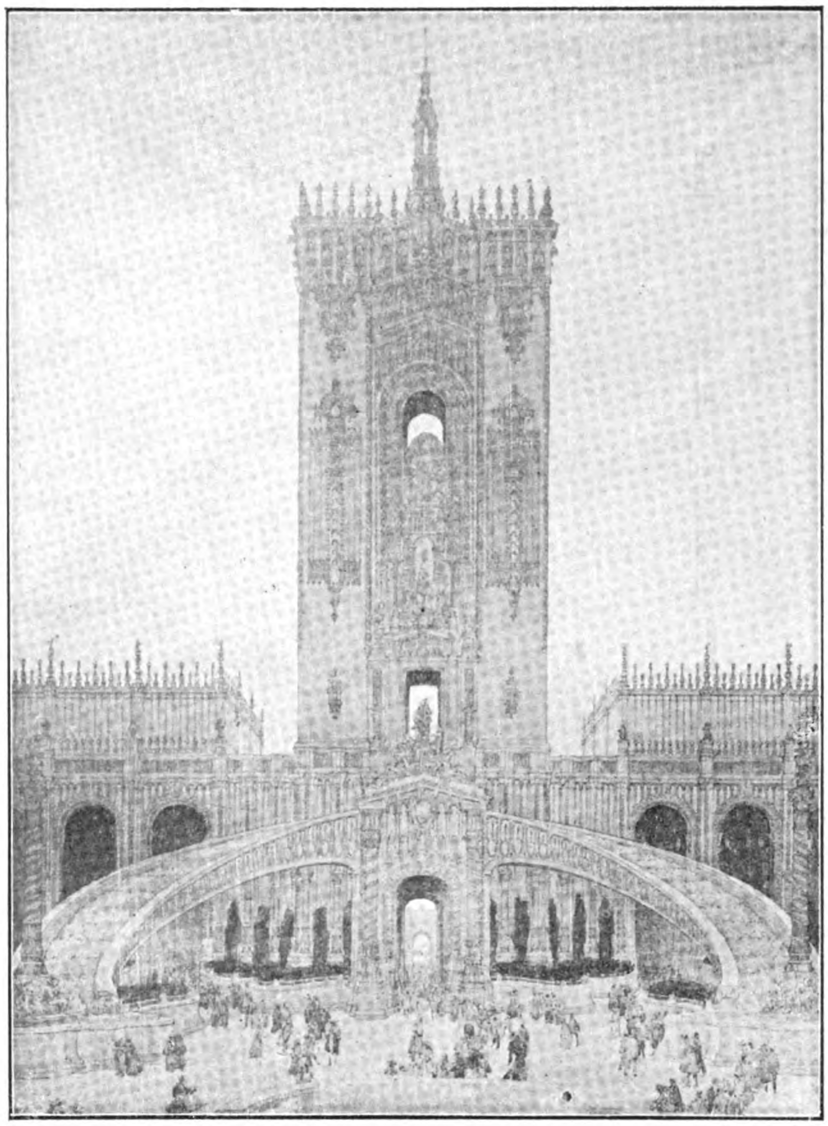
The buildings erected by the Exposition Company are scheduled at fourteen million dollars, but this cost may be reduced somewhat, if necessary, by less elaborate ornamentation on the buildings.

It is the purpose of this Exposition to bring together the achievements and activities of the world during the past decade for inspection and study by world experts, and for the instruction and information of all classes. The Classification is comprehensive and representative—a contemporary record of the progress of the human race—and has been reviewed by international authorities.

The Division of Exhibits is composed of eleven departments as follows: Department A—Fine Arts; Department B—Education; Department C—Social Economy; Department D—Liberal Arts; Department E—Manufactures and Varied Industries; Department F—Machinery; Department G—Transportation; Department H—Agriculture; Department I—Live Stock; Department K—Horticulture; and Department L—Mines and Metallurgy.

The Exposition will be entirely contemporaneous as far as awards are concerned, and no commercial article manufactured before 1905 will be reviewed. Secondly, though most comprehensive in classification, it will be selective rather than general—the test, one of quality rather than quantity, which, from the educational point of view, is of the utmost value to the seeker of knowledge, for it means condensation in the number of exhibits, diminution in space occupied, and conservation to the visitor of both mental and physical powers. The successful following out of such a line of policy entails of necessity an exact area estimate, and consequently it will be necessary that all applications for space shall be based on most conservative figures, stating the exact amount required for the artistic and educational presentation of the exhibit.

Within only nine months after issuance of President Taft's invitation—and two and one-third years before the



The Panama-Pacific International Exposition.—Great Cascade in the form of a staircase in the east or Festive Court at the Panama-Pacific International Exposition, San Francisco, 1915. This court will be one of three great courts dividing the central group of exposition palaces from north to south. The waters of the cascade, springing from a mysterious source, will flow into two great fountains. The court, representing the finest type of architecture of the Spanish Renaissance, is designed for pageantry upon a colossal scale. Here pageants surpassing the Durbar of India will be enacted. The great tower, 270 feet high, at the northern entrance of the court, will contain a great pipe organ with echo organs in the smaller towers. Mr. Louis C. Mullgardt, architect of the Fisheries building at the World's Columbian Exposition, is the designer of this court.

opening of the Exposition—an unprecedented record had been established by the fact that twenty-seven foreign countries and thirty-three States and Territories of the United States had signified their intention to participate. These twenty-seven foreign countries are:

Guatemala, Haiti, Salvador, Santo Domingo, Honduras, Mexico, Panama, Costa Rica, Peru, Bolivia, Japan, Ecuador, Uruguay, Canada, Liberia, France, Nicaragua, Cuba, Great Britain, China, Portugal, Chili, Holland, Germany, Spain, Brazil and Sweden.

Of these countries the following have selected their Government Pavilion site:

Japan, China, Sweden, Portugal, Canada and Holland. From assurances given, many other countries will send their acceptances soon, which insures foreign representation on a scale of magnificence and comprehensiveness never before enjoyed at an exposition.

The Philippine Government has made an appropriation of $250,000 gold, and appointed a Commission which has selected the Philippine Building site. Hawaii has also appointed a Commission which has selected its Building site.

The Exposition can be reached in twenty minutes from the ferry building. The site of the Exposition, at Harbor View, lies within the city limits as a crescent upon the shores of San Francisco bay, just inside the Golden Gate. No more picturesque location, nor one more appropriate to the celebration of a great maritime event, could be imagined. On the south, east and west it is encircled by towering hills with varying contours rising successively from 250 to 900 feet above sea level, like the enfolding walls of a vast amphitheatre. Upon the north the site opens out up on the harbor of San Francisco. The panorama at Harbor View recalls the famous Riviera upon the shores of the Mediterranean. In the harbor before the site lies Alcatraz Island, the location of a military prison whose white walls are reflected in the waters of the bay. Beyond are the hills of Marin county rising up into the hundreds and in some instances into the thousands of feet, with Mount Tamalpais, loftiest of all, its summit often shrouded with a turban of fog upon which the sun shines as upon a vast bank of snow, as a background for the setting.

The central portion of the site lies slightly above the sea and is encircled on three sides by gently sloping ground; within a short distance from the boundaries of the site these slopes change to steep hillsides and thus the center becomes the floor of a huge amphitheater, from whose sides the Exposition will be seen stretched out below. To the east and south the residence section encircles the Exposition grounds, and to the west and southwest the site is embraced by the wooded slopes of the Presidio military reservation, dark with cypress and eucalyptus and interspersed with occasional vistas of green valleys.

All told the site comprises 625 acres; the Exposition buildings, built upon an east and west axis, will face upon the north; they will parallel the stream of the great incoming traffic of the world through the western gate of the United States. The harbor itself will be a part of the great theater upon which will be staged the world's jubilee and the Golden Gate will be the entrance to the theater.

A marvelous panorama will be afforded visitors on ships coming through the Golden Gate. As one looks from the harbor he will see three main groups of Exposition buildings. There will be the great central group comprising the fourteen Exposition palaces to be devoted to general exhibits; there will be the group

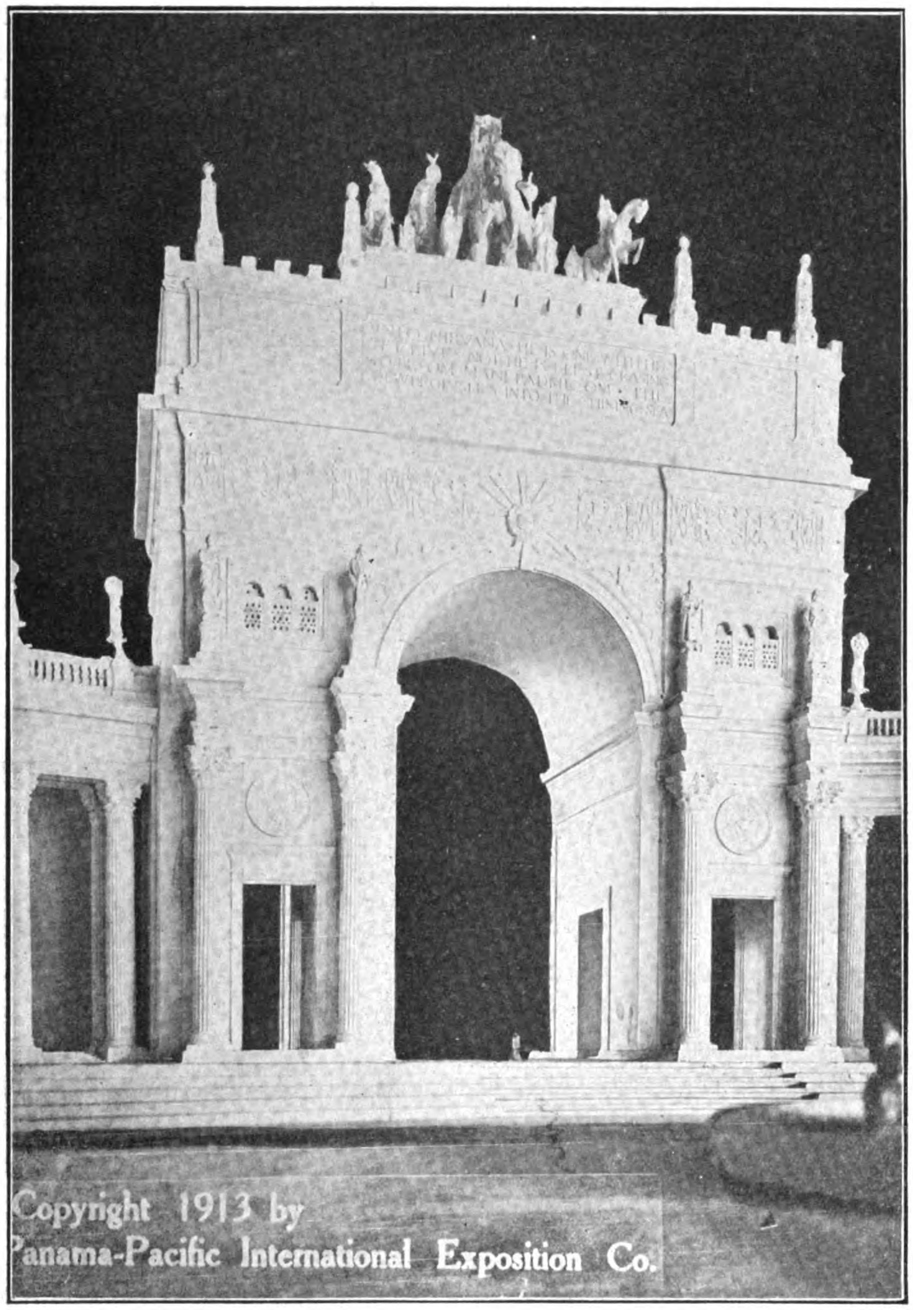
The Panama-Pacific International Exposition.—The dominating architectural feature of the Panama-Pacific International Exposition, San Francisco, 1915, the imposing tower of the Aministration building, which will lie at the south end of the Court of Sun and Stars. This tower, 400 feet in height, will be indescribably beautiful with statuary, mural paintings and mosaics; at its summit will be grouping of statuary supporting the globe typifying the world.

upon the left hand or east end devoted to amusement concessions and covering sixty-five acres; this will be the "midway." The right hand group upon the Presidio military reservation and nearest the Golden Gate will be devoted to the pavilions of the States and foreign governments.

The Exposition site at Harbor View, with its towering amphitheatre of hills and vast distances called for huge effects. The grouping of the fourteen great exhibit palaces will present this result. From afar the central group, facing for almost a mile upon San Francisco harbor, will seem as one colossal structure, a great Oriental city, with walls as high as the average six story city block, and with golden domes, towers and tower gateways rising to heights of 150, 270 and 400 feet. Nearer at hand it will be found that great inner courts lie between the buildings. Eight of the fourteen buildings in the main group will be joined in a rectangle to form almost a huge Oriental bazaar,—a veritable walled city with its domes, towers, minarets and great interior courts.

In general the buildings of the central group are to be brought into contact with those next adjoining by arcades, courts, and archways. Through this method of treatment four of the general exhibit palaces of the main group, fronting north upon San Francisco bay but set back a distance from the water's edge, will present a single architectural design. Their walls and the adjoining arches will form the main northern façade of the Exposition along the shores of the harbor, a marvelous frontage that will be first seen by visitors who reach the Exposition city by water and enter San Francisco bay through the Golden Gate. By day the glittering pillars and minarets of this mile long façade will be seen as a dream city, while by night they will reflect the sheen of a million lights into the waters of the bay.

Before the façade and along the harbor's edge for more than a mile there will be built a great esplanade, a vast stretch of ground and terraces in which fountains will play and groups of statuary be set at intervals. Brilliant flowers and hardy flowering trees and shrubs will lend warmth and color to the esplanade.



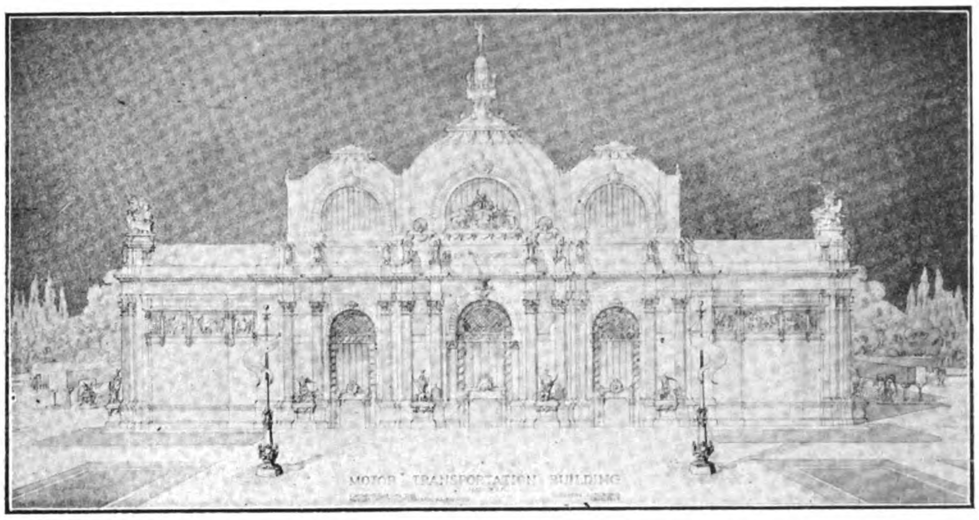
THE PANAMA-PACIFIC INTERNATIONAL EXPOSITION.—Triumphal arch on the east side of the grand court of honor, the Court of the Sun and Stars, at the Panama-Pacific International Exposition, San Francisco, 1915. The Court of Sun and Stars in size will correspond to the place before the Cathedral of St. Peter's at Rome. This triumphal arch, larger than the Arc de Triomphe at Paris, will lead into the great east or Festive Court. The size of the arch may be judged by the fact that the height of the archway will be ninety feet. The columns of the colonnade encircling the court will be sixty feet in height; the group surmounting the arch is composed of figures symbolical of the Orient—elephants, Arab warriors and camels—the tallest figure being twenty-eight feet in height. On the opposite side of the Court of Sun and Stars will be a triumphal arch of equal size, surmounted by prairie schooners and other figures typifying the Occident. The arch upon the east and the arch upon the west will exemplify the theme of the exposition, the meeting of the East and West in the Panama Canal.

Three great courts will divide the main group of Exposition buildings from north to south. Their theme will suggest the meeting of the East and West at Panama. One of the huge courts, that on the east, will suggest the Orient, rich in Oriental splendors; another, on the west, will suggest the Occident, its theme exemplifying the wealth which nature has conferred upon the Saxon who has ever pushed to the West. Between these two courts will be set the greatest of all the courts, the superb Court of the Sun and Stars, its theme upon a magnified scale symbolizing the union of the East and West at Panama. This court will stand out among the most brilliant architectural expressions of America and Europe. It will be distinguished by the majestic scale of its architecture; by the splendor of its conception, and by its life, color, and spirit of joyousness. The color plan of this court, as indeed of all the great courts, is designed by Jules Guerin, undoubtedly the foremost decorative artist in America.

In the courts marvelous blendings of color will be attained. Pompeiian red, strong Italian blues, vermilion and orange will predominate. The roofs of the exhibit palaces will be covered with Spanish tile, a reddish pink. But from afar the sightseer will gain the effect on the blending of the various tones. Mr. Guerin gives the following word picture of his color plan for the Exposition:

"Imagine a gigantic Persian rug of soft, melting tones, with brilliant splashes here and there, spread down for a mile or more, and you may get some idea of what the Panama-Pacific Exposition will look like if viewed from a distance, say from the Sausalito heights across the Golden Gate. For San Francisco's is to be unique among the Expositions of the world in that it will be a 'City of Color.' Not that color is the chiefest value of the Exposition, for its architectural features are equally remarkable. This color plan, that of making the group of buildings a veritable blaze of glory and at the same time avoiding the garish or barbaric is the great new salient feature of the Exposition."

The Court of the Sun and Stars will be 750 feet in width from east to west and 900 feet along its main axis. At the south end of the court will arise the huge tower



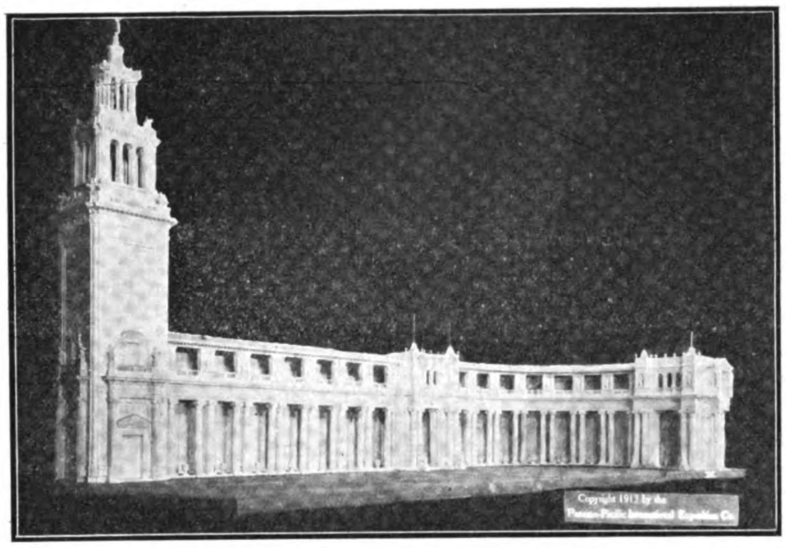
THE PANAMA-PACIFIC INTERNATIONAL EXPOSITION.—The Motor Transportation Building at the Panama-Pacific International Exposition, San Francisco, 1915. This structure will be one of the largest of the exposition palaces, approximately 275 ft. front by 800 ft. deed and covering more than fire acres. The theme of the architecture will be emblematic of that triumph of modern transportation,—the automobile. Groups of statuary will typify the triumph of the motor over the elements. Other groups of statuary will convey, allegorically, the victory of the motor boat over the sea and of the aeroplane over the air. On either side of the entire length of the building there will be a frieze ten feet high in base relief, giving the history of transportation from the early log-cart up to the most modern automobile. The dome which surmounts the center of the front portion of the bullding will be 130 feet high. Surmounting the dome will be a turret composed of the prows of motor boats, each carrying a searchlitht.

of the Administration building, 400 feet in height, and dominating the architecture of the Exposition. The upper part of the tower will take the form of terraces leading up to a group of figures surrounding the globe typifying the world; the tower will be lined with jewels which will glitter like diamonds when searchlights are turned upon them. At the base of the tower, which will occupy an acre in extent, will be a huge arcade 125 feet high, beneath which the visitor may enter into the Court of Sun and Stars from the main Exposition entrance.

In the vaulted archways of the tower will be grouped a series of mural paintings designed by Jules Guerin and expressing the keynote of the Exposition color scheme. But perhaps the most impressive feature of the Court of Sun and Stars will be found in a classic colonnade extending entirely around the court and screening the walls of the environing Exposition palaces. The columns will be sixty feet in height; surmounting the colonnade will be a series of 110 figures symbolizing the stars. Each figure will support a huge artificial jewel four feet in diameter. At night these jewels will glitter with dazzling lights; by day their radiance will be obscured.

In the center of the court will be a great sunken garden, with benches to seat about 7,000 people surrounding the garden. In the garden will be groupings of classic statuary, dancing figures, fauns, satyrs and nymphs; flowers, trees and vines will contrast with the statuary and with the superb colonnades and the towering golden domes.

To the east as one passes from the Court of Sun and Stars to the great east or Festive Court will be a huge triumphal arch 90 feet in height and surmounted by a colossal grouping of statuary; camels, elephants, and Oriental warriors will crown the summit of the great arch. To the west on the approach of the Court of Four Seasons will be a triumphal arch of similar size, surmounted by a group representing western civilization. A huge prairie schooner will comprise the central motif of the group.

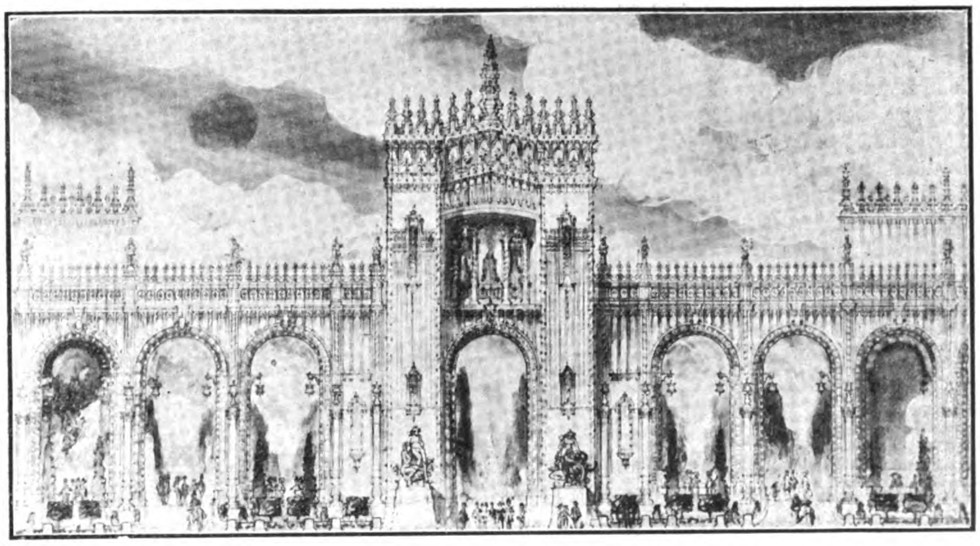


THE PANAMA-PACIFIC INTERNATIONAL EXPOSITION.—The marvel Court of Palms that will open out from the great exposition city upon a vast tropical garden upon the south at the Panama-Pacific International Exposition, San Francisco, 1915. This court, a marvel of tropical transplating, is south of the Court of Four Seasons and is designed by Mr. George W. Kelham.

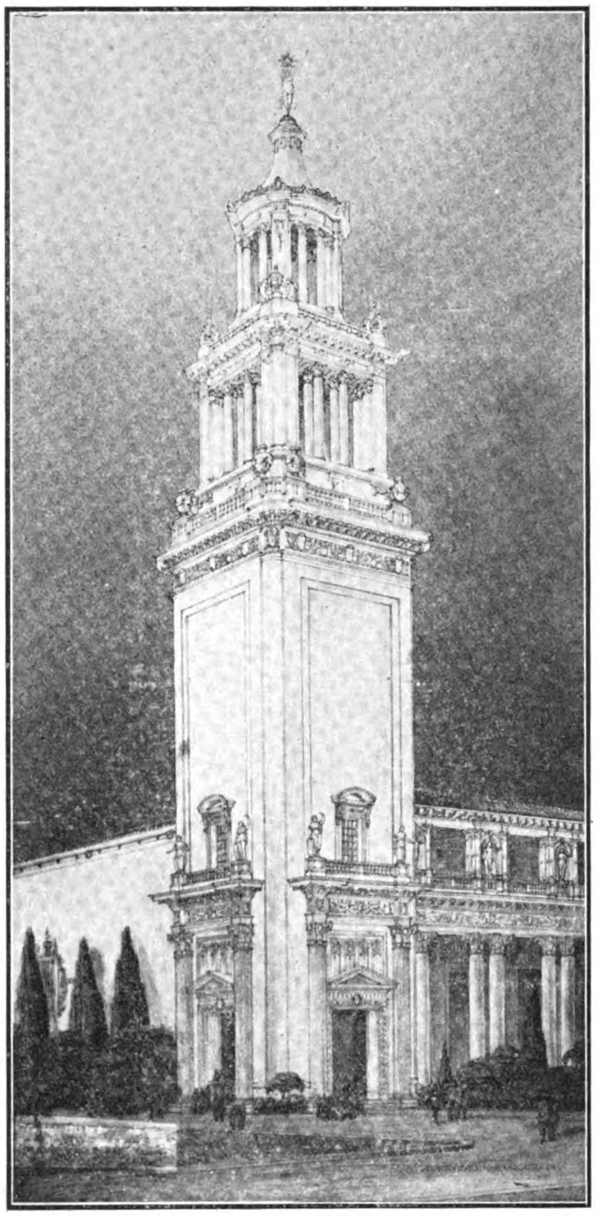
The Panama-Pacific International Exposition has attained a stage of development never before equalled at an American Exposition. With simultaneous construction being undertaken on all parts of the grounds, with thousands of men at work, and with the nations of the world giving their heartiest support to America, a marvel city will swing open its gates on February 20, 1915, upon a series of world displays which in quality, interest, usefulness, education and magnificence will never have been surpassed.

We are indebted to Mr. G. H. Corse, Jr., General Passenger Agent of the San Francisco Overland Routes, comprising the Pacific Mail Steamship Co., Southern Pacific and San Fe Railroads and their eastern connections, for the following information in regard to the progress of the enormous work that is incidental to the opening of the Fair.

Director of Concessions Frank Burt announces that the Committee on Concessions and Admissions has just granted the right to Jacob, Adolph & Mervyn Gunzendorfer to produce their original and remarkable concession "The Submarine" at the Fair. It will cost $150,000 and bids fair to interest thousands of visitors. It will be an amusing riding device that will afford the public an original, sensational experience and also demonstrate the utilization of the submarine for observation and other purposes. Steel submarine boats will dive into a great lake in which will be assembled startling and unique forms of vegetation and



THE PANAMA-PACIFIC INTERNATIONAL EXPOSITION.—Façade of the superb east or Festive Court, one of the most beautiful architectural creations of the Panama-Pacific Exposition, San Francisco, 1915. Mr. Louis C. Mullgardt, architect of the Fisheries Building at the World's Columbian Exposition in 1893, is designer of this court, which will portray the splendors of Oriental architecture.



THE PANAMA-PACIFIC INTERNATIONAL EXPOSITION.—One of the superb Italian towers that will mark the approach to the Court of Palms at the Panama-Pacific International Exposition, San Francisco, 1915. There will be two of these courts, identical in size, one south of the Court of Four Seasons and one south of the Festive Court, which will be known as the Court of Flowers.

animal life brought from the submarine continents of the world. The passengers will be comfortably seated and provided with individual portholes through which they may behold forests of coral and pearl beds, sponge gardens, seaweeds, specimens of unique fish and an almost endless variety of marine creatures in their native environment. The concession will be contracted into a large lake occupying an oblong site 200 × 300 feet in area and 12 feet at its greatest depth, yet by the manipulation of registering dials which record 10 feet for every one foot of actual submersion and by the use of mechanical screens which are caused to move upward as the boat is going down, the passenger will actually feel that he is diving some three hundred feet.

According to Director of Concessions Frank Burt, more than 24 concessions have already been granted by the 1915 Exposition. Of this number some of the leading attractions will expend $1,505,000.00 in preparing for the entertainment of thousands of visitors who are coming to the Panama-Pacific International Exposition. Following is a part list:—

NAME	CONCESSION	AMOUNT TO BE INVESTED.
Remington Typewriter Co.	Public Stenographic Booths	$150,000.00
Santa Fe Railroad	Grand Canyon of Arizona	250,000.00
Drs. Couney & Fischel	Infant Incubators	25,000.00
L. E. Myers	Panama Canal	150,000.00
L. E. Myers	Panamanion Souvenirs	25,000.00
Dale, Davis & Lewis	'49 Camp.	100,000.00
Orange Blossom	California Candies	10,000.00
Patrick Brothers	Ice Palace & Hockey Arena	150,000.00
Pacific Aeroscope Co.	Aeroscope	100,000.00
Marcel Glessinger	Trianon	60,000.00
E. W. McConnell	Creation	160,000.00
E. W. McConnell	Evolution of the Dreadnought	150,000.00
E. W. McConnell	Cyclorama Battle of Gettysburg	25,000.00
E. W. McConnell	Human Roulette	16,000.00
L. A. Thompson	Racing Coaster	60,000.00
L. A. Thompson	Scenic Railway	60,000.00
C. L. Sept	The Old Mill	15,000.00

Permission has been granted by the Panama-Pacific International Exposition to the National Association of Automobile manufacturers to erect a motor transportation building on the 1915 Exposition site. This structure is to house the most attractive automobile show ever held in the world, and which is to last through the entire period of the International World's Fair. The design of this building is one of the most modern notes in the composition of the Exposition, and harmonizes admirably with the general classic lines established by the Architectural Commission. In this building the process of manufacture and assembling will be shown and the importance and extent of this great industry will be placed before the world. This structure will be one of the largest of the Exposition Palaces. It is approximately 275 feet front by 800 feet deep, covering somewhat over five acres.

Official announcement has just been made by the State Department to President Moore of the Exposition that the Government of Argentine Republic has decided to participate in the Exposition and is organising an exhibit on an elaborate scale and will make a large appropriation for its participation. The Exposition officials are elated, as it means that South America will be well represented at the 1915 World's Fair. Every central American country has accepted the President's invitation and the fact that Argentine Republic will take part means that other countries of South America will follow her example.

There was something rather poetic about the term "The Middle Kingdom," but the "Middle Republic" would sound ridiculous, says a Kobe paper. Many picturesque antiquities are destroyed in the making of a republic On the Eastern Chinese Railway the mail coaches used to bear the painted inscription "Middle Flowery Kingdom." This has now disappeared in favour of "Communications Department of Great China." It is reported that great indignation is felt at the change. It is singular that the infant monarch should have been disposed of so light-heartedly, but that so much value should be attached to the royal name of his domains.

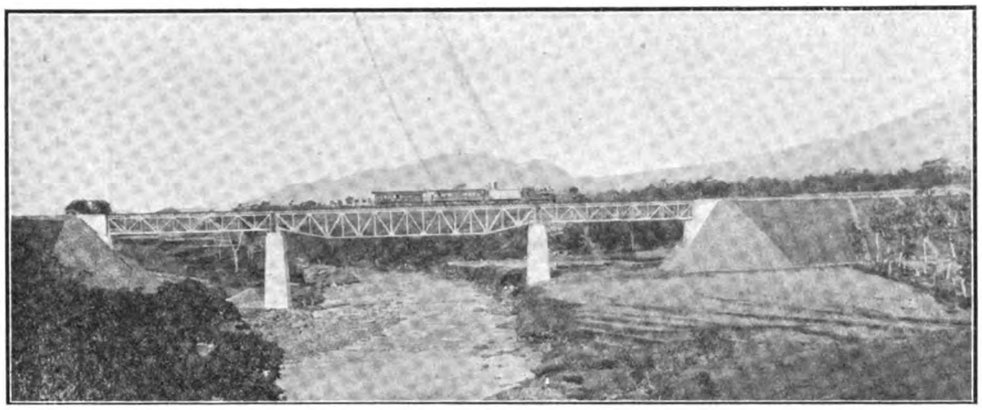
THE PANAMA-PACIFIC INTERNATIONAL EXPOSITION.—Chinese Commissioners reviewing troops during dedication ceremonies for China's site, October 24, 1912.

DUTCH EAST INDIES RAILWAYS

A LESSON IN STATE MANAGEMENT

To those who are interested in the never-ending discussion on the relative merits of State or private ownership of railways, authentic information in regard to the State Railways in Netherlands-India will be of interest. We are indebted to the excellent report of Commercial Agent D. C. Alexander for the facts and figures given in the accompanying article.

The State Railways of the Dutch East Indies are under one general management, with head offices at Batavia, but they are operated in four divisions, as follows: West Java line, 641 miles in length and the construction of which cost $37,267,473 United States currency; East Java line, 598 miles long and costing $29,361,332; West Coast of Sumatra line, 152 miles long and costing $9,092,629; and the Tykampek-Tylamaja tram line, 38 miles long and costing $99,940. This gives a total cost of $75,821,374. All these are of the Dutch Indies standard gauge (1.067 meters or 3 feet 6 inches.) In addition, the State owns and operates 17 miles of 60 centimeter (23.62-inch) gauge steam tram lines, which serve as feeders for the main lines.



DUTCH EAST INDIES RAILWAYS.—Bridge over the Progo River near Djohja

As references to the steam tram lines must frequently be made in this and other reports on Java, it may be stated that many of the steam tram lines in Java can hardly be distinguished from railways proper. Most of them had their origin as narrow-gauge city tram lines carrying passengers only; but they have been extended from town to town, their gauge widened heavy rails laid, and freight and parcels service added. Up to the present time steam traction has been exclusively employed on these lines, but to-day most of them are planning to substitute electric traction for steam, the power, in many cases, to be obtained from hydroelectric plants.

The following tables on passenger service and earnings indicate not only the density of traffic on the State Railways and the substantial net earnings, but also the steady increase in both, which is the justification for the heavy outlay for extensions and improvements now being made and for those about to be begun. In the past extensions and improvements have not kept pace with increasing traffic, but the railway administration is now fully awake to the necessities of the situation, and has adopted comprehensive plans for expansion and betterment. The most important step in this direction is the recent decision of the Dutch Government to begin at once the construction of the Middle Sumatra Railway, a line which will extend through the whole length of the island of Sumatra. Another step is the purchase, very recently concluded, of a privately owned line from Batavia to Buitenzorg, 35 miles in length and of the Dutch Indies standard gauge; while a third step will have been taken by the end of 1914, when there will be opened for traffic in the west of Java three branch lines, aggregating about 160 miles.

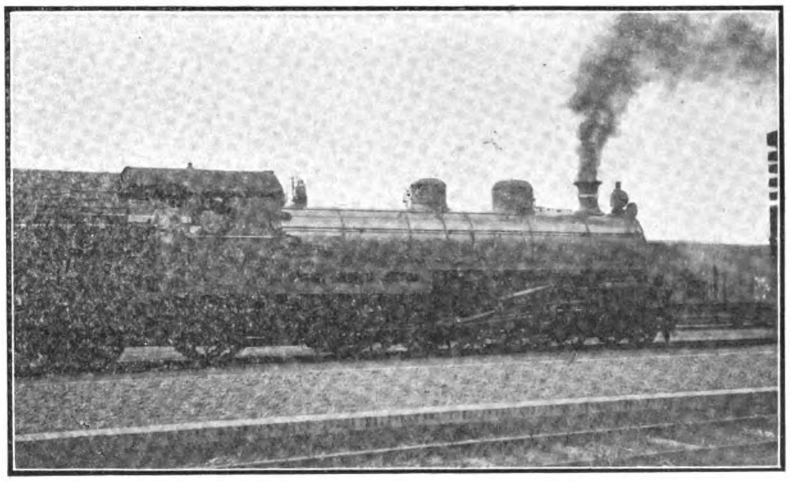
TRAFFIC, EARNINGS, AND EQUIPMENT

The following table shows the traffic and earnings during the years 1900, 1909, and 1910. In this table and throughout the entire report United States currency is used.

	1900	1909	1910
Total passengers carried	....	25,597,241	27,102,836
Gross revenue from passenger and freight traffic	$5,251,110	$8,283,044	$9,333,065
Net earnings for the year	$2,340,960	$3,392,290	$4,308,059
Percentage of net earnings to capital cost	....	4.58	5.73

The equipment of locomotives and rolling stock at the end of 1910 was as follows:

Lines.	Locomotives.	Passenger coaches.	Goods wagons.
West Java line	205	98	3,498
East Java line	189	576	3,777
West Sumatra line	65	74	634
Tykampek-Tylamaja tram line	2	12	21
Total	461	760	7,930



DUTCH EAST INDIES RAILWAYS.—One of the recently imported locomotives for the Eastern Division

TYPE AND MANUFACTURE OF LOCOMOTIVES

On the West line, where the grades are heavy, the locomotives in use are correspondingly large and powerful, there being now in service 16 Mallet-Rimrott compounds of 0-4 and 4-2, weighing 32½ metric tons each; 23 Mallet-Rimrott compounds of 2-6 and 6-0, weighing from 45.7 to 46.3 metric tons each without tenders. The latest locomotives imported for the West line are 10 of the Pacific type, each having a weight, empty and without tender, of 47 metric tons. As these give a speed of 40 miles per hour on a 5 per cent. grade, with 300 metric tons load, and as they have been found more economical in operation and repair cost, it is probable that this type will supplant the Mallets. The railway officials have recently ordered several 2-12-2 locomotives for express

service. On the West line, trestle construction has been largely employed to avoid heavy cuts and fills.

On the East line, where the grades are comparatively light, both freight and passenger service are maintained by compound tank engines of 2-6-0; and tender locomotives of 4-4-0 and 2-4-0. Sixty-five per cent. of the locomotives in use on the Java State railways are of German manufacture, 23 per cent. British, and only 5 per cent. have been built in the Netherlands. On the East Coast of Sumatra line all of the 65 locomotives are of German manufacture.

All passenger coaches now in use have been built in Java, only wheels, axles, and bogies have been imported. Sixty-five per cent. of all the freight cars in use are the closed two-axle goods wagons. A few of this type are built on bogies, and are double the length of the ordinary wagon; but the smaller car, with a capacity of 12 tons, has been found more satisfactory. These cars, with the exception of the wooden floors, are usually purchased from European builders and shipped "knocked down" to Java, where they are easily assembled. The price of the small car delivered in Java is said to be from $320 to $330 each.

Six repair shops are maintained in Java for the State railways. These are situated at Bandeong, Madioen, Soerabaya, Mt. Cornelis, Djember, and Poermoredio; but only the first three named are of sufficient size to deserve detailed description. The main shop for the West Java line being the largest, will be considered first.

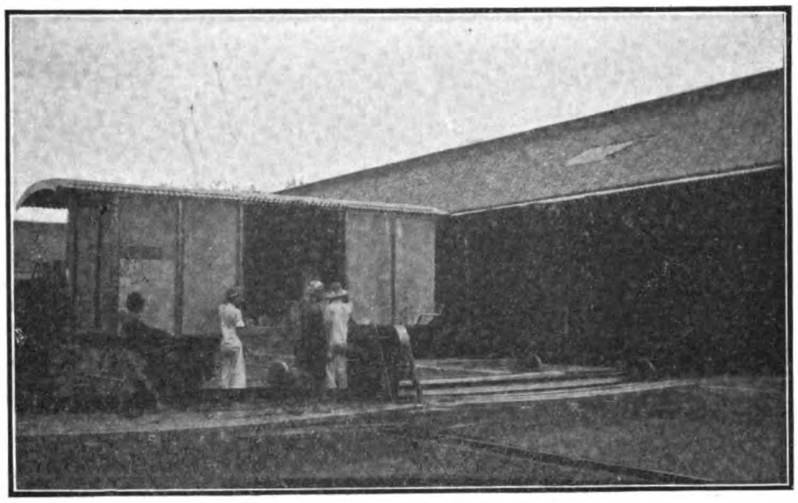
Bandeong Works

As each branch of the work in the Bandeong shops is rigorously separated from the other branches, there are in all some 16 buildings, which are in eight parallel rows. Each of four transfer tracks thus serves four buildings, all of which are left open on one side for the rail lines to enter. A rail line also traverses the length of the yard, dividing the buildings into two groups of eight. For a tropical country this arrangement seems an excellent one.

Power is obtained from a hydroelectric plant a few miles away. This power station, like many others in Java, has been built by a private company; but by the terms of the company's charter the Government retains a considerable measure of control and must approve the rates at which power is to be sold. In this case the rate is $1.60 per horsepower per month, the shops taking about 300 horsepower in all. Current is transmitted from the power station as 3-phase, 50-cycle, at 6,000 volts, which is transformed at the shops to 220 volts alternating current. A $13\frac{1}{2}$-kilowatt direct-current dynamo, driven by an alternating current motor, lights the shops at a voltage of 230. In this connection it may be said that practically all of the motors and other electrical apparatus now installed in and ordered for the shops at Bandeong, Madioen, and Soerabaya are from a single German company, which appears to have a virtual monopoly of the electrical supply business in Java.

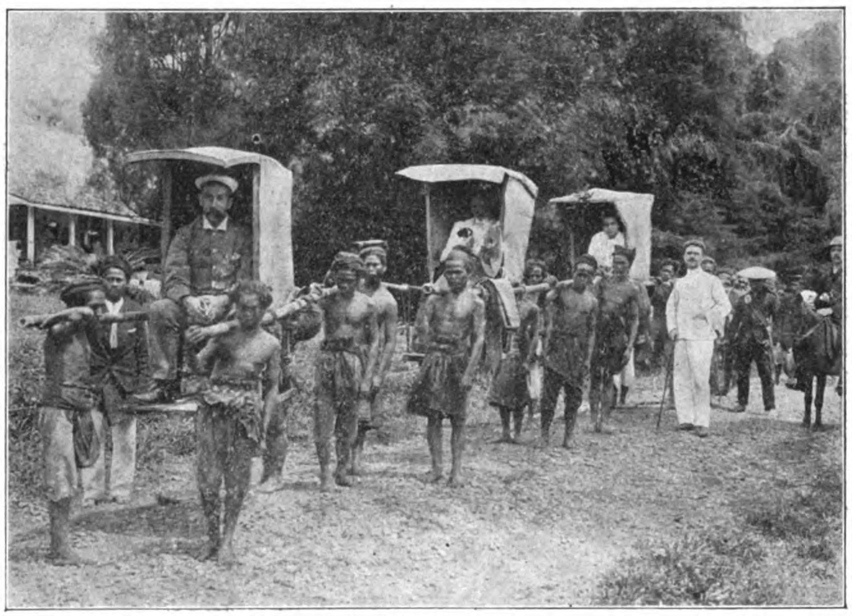
Forge and Blacksmith Shop-Wheel Shop

The forge and blacksmith shops at Bandeong and Madioen are the cleanest and most orderly the writer has ever seen. All of the fires (there are 45 at Bandeong) are completely hooded and connected with an underground brick-lined tunnel, with an exhaust fan driven by a 40-horsepower motor at the base of the stack. The absence of the usual litter of iron, tools, etc., from the floor may result from the workmen's consideration of their own bare feet; but the clean windows, fresh paint, and general absence of grime and disorder are a tribute to the proverbial orderliness of the Dutch.



Dutch East Indies Railways.—A 12-ton goods wagon used principally for transporting sugar.

The hammer equipment of the shop includes three steam hammers of 2, 5, and 8 hundredweight; and a new Yeakley motor-pneumatic hammer of 1 hundredweight from Bêche & Crohs, of Huckeswagen, Germany. The combined punching and shearing machine is from the Werkzeugmaschinenfabrik, of Chemnitz; and the spring-testing machine from Möhr & Federhaff, of Mannheim, Germany.



Sedan Chairs in Java

The boiler shop is served by a 15-ton electric traveling crane, built by the Harlem (Holland) Maschinenfabrik; and the equipment includes a 20-foot plate planer from the Niles Tools Works, of Hamilton, Ohio; three cold saws and a plate straightener, from Gustav Wagner, of Rutlingen, Germany; and a 30-millimeter plate shear, also of German make. Compressed air is not used in any part of the works, the management having found that the Javanese workman are not strong enough to use air hammers properly. Consequently all riveting, calking, chipping is done by hand. Some electric drills are in use, however.

The foundry contains three cupolas; two with a capacity of 13 hundredweight per hour each; and a new one with a capacity of 2 tons per hour. One of the old cupolas is of the Herbert removable bottom type, with steam ejector, but this has not been found altogether satisfactory. There are four Piat brass furnaces, each with a capacity of 130 pounds; but no molding machines have thus far been installed.

All of the lathes in the wheel shop are from the Chemnitzer Werkzeugmaschinenfabrik of Chemnitz, Germany, successors to the firm of Joh. Zimmermann. As their machines are usually referred to as Zimmermann's, that name will be used throughout this report. The largest of the five lathes swings 6 feet, which is ample, since the largest locomotive drive wheels in use are only 150 centimeters (4.92 feet) in diameter. Wheels for freight and passenger cars are uniformly 74 centimeters (29.13 inches) in diameter, and both the chilled-iron and steelbody type are in use. The newest wheel lathe, which has four tool rests, swing 1 meter; and another of the same size but more powerful design has been ordered from the Maschinenfabrik Deutschland, of Dortmand, Germany, for high speed turning with gang and formed cutters. There are four radial drills in this shop; three of German and one of British make.

Main Machine Shop

The equipment of the main machine shop is about equally divided between American and German machine tool builders, with a few British builders represented. Most of the German machines are from either the Zimmermann shops, or from the Sachische Maschinenfabrik of Chemnitz, successors to Richard Hartmann. They are usually known as Hartmann's machines and will be so called in this report.

The predominance of these two makers among the German tools in the shop is said to be due to the fact that a majority of the locomotives in use on the Java railways have been built by these two firms, and that tools for repairing them were "naturally bought from the makers of the locomotives." The American machines now installed are:

The American Tool and Machine Co., of Boston: One turret lathe (2 inches hrought headstock) with thread-chasing attachment.

Hendey Machine Co., of Torrington, Conn: Three 12-inch engine lathes, with taper attachment and compound tool rest, but with European style of tool post.

Hamilton Machine Tool Co., of Hamilton, Ohio: Two 22-inch upright drills.

Automatic Machine Co., of Bridgeport, Conn.: One automatic lathe with 10-inch swing.

Landis Tool Co., of Waynesboro, Pa.: Two plain grinders, one about 8 by 30 inches, and one 24 by 72 inches; one surface grinder, table 10 by 36 inches; four $1\frac{1}{4}$-inch single head bolt cutters.

Becker-Brainard Milling Machine Co., of Hyde Park, Conn.: One No. 5 vertical milling machine.

Cincinnati Milling Machine Co.: One No. 1 plain horizontal milling machine.

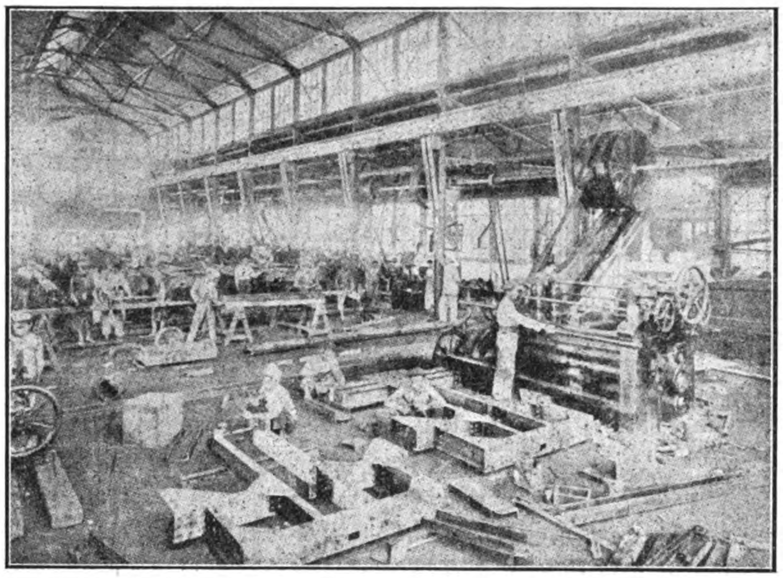
Warner & Swasey Co., Cleveland, Ohio: One No. 2 hollow hexagonal turret lathe.

Gisholt Machine Co., of Madison, Wis.: One universal tool and cutter grinder.

Shaper of American make, 14-inch, from which the maker's name has been removed.

Of British machines there are only a vertical surface grinder, with oscillating feed, from Beyer, Peacock & Co. (used principally for grinding side rods and guide bars); one of Geo. Richards's open-side planers, in which the arm carrying the cutting tool travels over the work: and a single head-bolt cutter from Kendall & Gent.

The Hartmann machines include four gap lathes, swinging 22 to 30 inches over the bed; several upright drills, one horizontal cylinder boring and facing machine; a 6-foot plain radial drill; and a twist drill grinder. Larger machines from the same maker are one 4-foot 6-inch surfacing lathe, and a new gap lathe, swinging 48 inches over the bed and taking 16 feet between centers.



DUTCH EAST INDIES RAILWAYS.—State Railway Workshops at Bandoeng.

From the Zimmermann shops there are three small horizontal plain milling machines; one large vertical milling machine, with spindle 3 inches in diameter; three single-ram and one double-ram traverse shapers; a small planer with one head; a 15-inch profiling slotter; and a couple of upright drills. A 10-inch precision lathe has recently been ordered for this shop from W. von Pittler, of Germany, but has not yet arrived.

A lathe from H. Wohlenberg, of Hanover, Germany, was pointed out as having a feature worthy of consideration by American makers. In this machine the carriage is guided by shears on the side instead of the top of the bed. This arrangement is said to prevent the wear which usually occurs from chips falling into the "V's," thus keeping the lathe in alignment for a longer period.

WOODWORKING AND CAR-BUILDING SHOP.

The equipment of the woodworking and car-building shop is not equal to that of the other shops in the works, most of the machines being old and many quite out of date. A large majority of the machines are from Perin & Panhard of Paris, France, or Panhard & Lavassor, of the same city. The same firm has supplied three surfacing planers, a tenoning machine, a two-spindle drill, a hollow chisel mortising machine, and two vertical band saws. Three large frame saws are from Panhard & Lavassor, and a horizontal plank-ripping band saw is from the shops of Pickles & Son, of Headen Bridge, England. The more modern machines are a chain mortising machine from the New Britain Machine Co., of New Britain, Conn.; and from T. Robinson & Son, of Rochdale, England, an automatic-feed triple-drum sander, and a tenoning machine.

The wood principally used for car building is Java teak, which is noted for its durability and works easily. As this wood has advanced in price within recent years to 21 cents per cubic foot, other varieties of Java and Sumatra woods are now being introduced into car building.

In all, about 1,500 men are employed in the Bandeong shops, all of whom are Javanese except 75 to 100 Chinese carpenters and pattern makers. For woodworking the Chinese have been found much more efficient than the Javanese, and their wages are correspondingly higher. Carpenters receive from 50 cents to $1 per day; smiths about the same; foundrymen, 24 to 60 cents; boilermakers, 32 to 80 cents; machine-tool men, 32 cents to $1; painters, 32 to 60 cents; and coolies, 16 to 20 cents.

MADIOEN SHOPS.

The Madioen shops execute most of the repairs for the East Java line, though, as will be mentioned later, the shops at Soerabaya are now being extended to handle a part of this work. Very large extensions are being made to the Madioen shops; the old buildings are being remodeled and many new ones erected. While not so compact as the Bandeong works, the general arrangement at Madioen is much the same. The rail lines enter the workshops from the sides, four transferers serving to connect the different buildings.

The present power is generated by a couple of simple engines of 50 horsepower each from Stork Bros., of Hengelo, Holland; but a hydroelectric plant is now being built a few miles away which will supply 500 horsepower to the shops, current to be transmitted at 6,600 volts, 3 phase, which will be transformed to 230 volts alternating current in the works. As a reserve, a 450-horsepower steam engine has been ordered from the firm of R. Wolf, of Magdeburg, Germany. This is to be of the usual Wolf design, the engine mounted upon the boiler and with the fire tubes secured only to the boiler head, so that they, with the head, can be withdrawn from the barrel for cleaning and repairs. While such an arrangement might be satisfactory in a 50-horsepower unit, it does not seem likely that it could prove so in a 450-horsepower unit.

A Javanese Money Changer

The new forge and blacksmith shop, which is to be 272 feet long by 59 feet wide, will have 64 fires, as against 28 at present, the general design being practically the same as that of the Bandeong shop. Forges, blowers, and fans have been ordered from the Sturtevant Engineering Co., of London, and three Yeakley motor-pneumatic hammers of 2, 5, and 10 hundred-weight, respectively, will be installed.

The new foundry, which is to be only slightly smaller than the smith shop, will have a 10-ton rope crane, two cupolas, each with a capacity of 1½ tons per hour, and five Piat brass furnaces, each to handle 220 pounds. Three small hand-power molding machines are also to be installed. These, though ordered through a German firm, are believed to be of American manufacture.

The reconstructed boiler shop is to have an almost entirely new equipment, which will include a 20-ton electric traveling crane from the Benrath Works, of Dusseldorf, Germany; an 18-foot plate planer, and two 6-foot universal radial drills from the Niles Tool Works, of Hamilton, Ohio; bending and straightening rolls from the Zimmermann shops; combined punching and shearing machine with 8-horsepower motor, from the Stahlwerk Oeking, of Dusseldorf; and a large pipe bending machine from Sauer & Co., of Germany. The only old machines which will be retained are several radial and upright drills.

MACHINE SHOP.

It is interesting to note that while the present equipment of machine tools is almost entirely German, most of the tools ordered for the new shop are of American make. There are now from the Zimmermann shops two 4-foot plain radials, two small universal milling machines, a small wheel press, and a slotter. From the Hartmann shops there are a vertical milling machine, a slotter, two planers, and several small lathes, including a turret lathe with 12-inch swing. Two wheel lathes, each swinging 6 feet, are from the Vulcan Works, of Chemnitz; and there are also two 5-foot surfacing lathes from Ernst Schiess, of Germany. The other German makers represented are Brewer, of Kalk, with a two-ram traverse shaper; J. E. Reinecker, of Chemnitz, with a plain grinder 8 by 30 inches; and Grafenstaden, with a couple of small capstan lathes.

The only American machines now in use are two small shapers from the American Tool Works, of Cincinnati; and a plain grinder (12 by 72 inches) from the Landis Tool Co., of Waynesboro, Pa. The only British machine on the floor is a vertical surface grinder from Beyer, Peacock & Co., of Manchester.

Of the new machines ordered for this shop the following are American: One No. 3 vertical milling machine, from the Cincinnati Milling Machine Co; one No. 3 universal milling machine, from Kearney & Trecker Co., of Milwaukee; one 5-foot universal radial drill, from the Niles Tool Works, of Hamilton, Ohio; two 2-inch bolt cutters (said to be of

Landis make though ordered through a German firm) ; two 12-inch shapers, from the American Tool Works, of Cincinnati; a slotter, with 10½-inch stroke, from the Niles-Bement-Pond Co., of New York; a small turret lathe. from the Warner & Swasey Co., of Cleveland; two Rockford upright drills; and a universal tool grinder, from the Gisholt Machine Co., of Madison, Wis.

One of Geo. Richard's Co., of (Manchester, England) open-side planers has been ordered; and a precision lathe, duplicate of the one ordered for the Bandeong shops, is to come from W. von Pittler, of Germany. The price of the latter machine, which swings 10 inches and takes 24 inches between centers, is said to be $1,030. A new high speed lathe for turning locomotive tires has been purchased from the Maschinenfabrik Deutschland, of Dortmund, at a price of $3,800. This lathe, which will swing 6 feet and is to be used with gang and formed cutters, will be driven by a 25-horsepower motor, which, however, is not included in the price. Another order which has gone to Germany is for a nickel-plating plant, to be supplied by the Langbein Works, of Leipzig.

WOODWORKING AND CAR-BUILDING SHOP.

All the woodworking machines now in use are from the Paris firm of Perrin and Panhard, except an automatic frame-saw grinder from a German firm. The French machines include two frame saws, two circular-saw benches, a mortising machine, and a couple of planers and shapers. All of the new machines for this shop have been ordered from the Bolinders factory, of Stockholm, Sweden, which will supply five log-sawing machines, five circular Saw benches, five molding machines (of different sizes and types), and mortising and tenoning machines.

When the new shops are completed and the new tools installed about 2,000 hands will be employed, as against 1,200 at present. Labor conditions are practically the same here as at Bandeong, and wages are about the same.

SOERABAYA SHOPS.

The shops at Soerabaya, which are small and badly arranged, are soon to be transferred from their present location at Soerabaya-Kotta to a new site at Soerabaya-Gobeng, where new buildings are now being erected. The new works, though much smaller, will greatly resemble the Bandeong shops both in general layout and in the design of buildings, and large provision is being made for extensions when they may be required.

Although the works managers realize that most of the old machines should be scrapped rather than moved, it has been decided, since the new shops are to be so much larger than the old, to transfer nearly all of them, but with the intention of replacing them with new machines as soon as possible. These old machines include one or two traverse shapers and several upright and radial drills from such British makers as J. Whitworth, Appleby Bros., and Wayne & Co.; and a number of lathes, drills, and milling machines from German makers—De Fries, Zimmermann, Hartmann, and Reinecker. The only modern machines in the present shop are a 16-inch engine lathe, from Schumacher and Boye, of Cincinnati; and a double-headed bolt cutter, from the Landis Tool Co., both of which were much complimented.

A majority of the new machines are, it is said, to be of American make, though in many instances the works managers do not know the exact maker, since nearly all of the new machines have been selected from German catalogues, issued by German firms which state frankly that they endeavor to conceal from their customers the names of the makers whose machines they supply. Among the machines which the German agents have sold the railway as American made (but maker's name not disclosed) are two high-speed drills, two shapers, four high-speed lathes, and a vertical milling machine.

The known American machines are two Rockford upright drills, one turret lathe from Warner & Swazey, two plain grinders from the Gisholt Machine Co., a twist drill grinder from Manning, Maxwell & Moore, and a slotter from the Niles-Bement-Pond Co.

The new machines ordered from European makers include an open-side planer from George Richards, a plain milling machine from J. E. Reinecker, a slow-speed cold saw from Gustav Wagner, and two high-speed wheel lathes from the Maschinenfabrik Deutschland. The latter are to be similar in design to the lathe ordered from the same company for the Madioen shops, but somewhat smaller in size.

As it is expected that the Soerabaya shops will be occupied with light repair work rather than heavy repairs to locomotives or car building, the woodworking shops will be very small, and the new foundry will have but one cupola, with a capacity of only 1½ tons per hour, and only two brass furnaces to melt 190 pounds each. The forge and smith shops likewise will be much smaller than those at Bandeong and Madioen, as there will be only 44 fires and three power hammers. Two of the latter, from the old shop, are steam driven, while the third is a new Yeakley motor-pneumatic of 3 hundredweight.

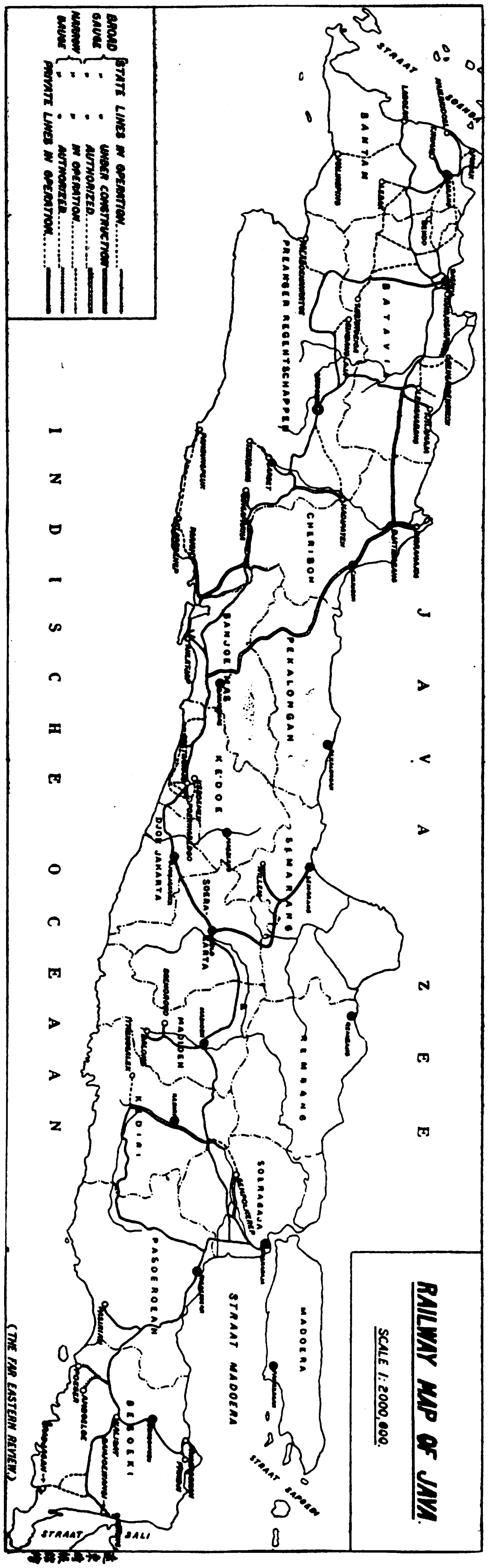
Wages in the Soerabaya shops average somewhat higher than in Bandeong or Madioen, but seldom exceed the maximum rates paid in those shops.

In Java railway trains are not operated at night—that is, from 7 p.m. to 5 a.m. Therefore very little provision is made for lighting passenger coaches. An acetylene plant has recently been installed, however, at Bandeong, which has a capacity of 15 tubes per day, compressed to 220 pounds per square inch; and acetylene lighting apparatus is being substituted for oil lamps in the cars of the through trains.

JAPANESE STATE MONOPOLIES

Official figures just published by the Japanese Monopoly Bureaus show that the approximate net profit from the monopolies for the last fiscal year amounted to Y.65,978,176, an increase of Y.3,845,764 on the estimates, and of Y.2,642,077 on the actual net profits for the preceding fiscal year.

It must be remembered that much of this so-called "profit" is indirect taxation, for which the State monopoly system affords a convenient medium for collection.



THE IMPORTANCE OF THE MINING INDUSTRY TO CHINA

By F. L. Cole, Mining Engineer, Shanghai, China.

With the advent of the change of government in China and the evident desire for progress along modern industrial lines, the exploitation of the mineral resources and the making of regulations to govern such exploitation comprise some of the most interesting problems which the new government must take in hand.

As an evidence of the importance of the mineral products to a country, the following quotation from "The Business of Mining," by Arthur J. Hoskin, is an interesting example: "In the United States in 1900 the census returns showed that agriculture produced about $725 (gold) per capita, mining $1,910 and manufacturing which is dependant upon the others $760. The *National Banker* has said statistics show that the combined dividends paid by the gold and silver mining companies of the United States are greater than the combined dividends paid by all the banking institutions of the country, and the combined dividends paid by the copper mining companies of the U. S. exceed the combined dividends paid by our railroads."

The following tables of statistics from the 1912 statistical number of "The Engineering and Mining Journal" show the production of metals and mineral and chemical substances in the U. S. for the past three years:

Production of Metals in the United States

Metal	Unit	1910	1911	1912
Copper (*a*)	pounds	1,086,249,983	1,083,856,371	1,242,836,024
Ferromangese	long tons	224,431	184,717	202,186
Gold (*b*)	dollars	96,269,100	96,890,000	91,685,168
Iron	long tons	27,079,136	23,464,627	29,445,068
Lead (*c*)	short tons	392,704	400,958	418,224
Nickel (*e*)	pounds	32,050,032	29,545,967	33,311,233
Quicksilver	flasks	22,418	21,500	(*f*) 25,147
Silver (*b*)	troy ounces	57,137,900	60,399,400	62,369,901
Zinc (*d*)	short tons	277,065	295,836	347,922

(*a*) Production from ore originating in the United States. (*b*) The statistics for 1910 and 1911 are the final and those for 1912 are the preliminary statistics reported by the director of the Mint. (*c*) Production of refined lead from ore and scrap originating in the United States; antimonial lead is included. (*d*) Total production of smelters, except those treating dross and junk exclusively; includes spelter derived from imported ore. (*e*) Imports for 1912, first 10 months only. This nickel is refined in the United States for the production of metal, oxide and salts. (*f*) As reported by U. S. Geological Survey.

Production of Mineral and Chemical Substances

Substance	Unit	1910	1911	1912
Arsenic	pounds	3,052,000	6,162,000	5,852,000
Coal, anthracite (b)	short tons	82,670,235	492,647,863	511,964,403
Coal, bituminous (b)	short tons	411,126,408	402,121,307	427,655,966
Coke (b)	short tons	36,056,059	34,972,534	41,803,199
Copper sulphate	pounds	26,356,788	33,454,000	39,480,741
Iron ore	long tons	53,267,397	41,878,190	59,485,477
Petroleum	barrels	210,588,308	218,372,850	218,970,815
Tungsten ore	short tons	2,130	1,139	(c) 1,290

(b) All coal and coke statistics are the estimates of *Coal Age*. (c) As reported by the U. S. Geological Survey.

While the definite information available at present does not show that China is possessed of as favorable precious metal deposits as the United States, there is every reason to believe that these deposits are of great value and that in coal and iron, which have made the basis of the greatest industries of the U. S. and England, China is as well or better supplied as those countries. Coal occurs in nearly every province, and in quality it compares favorably with that of any country. Striking examples of the demand for coal and the possibilities of its development are that a large part of the coal on the Shanghai market is from Japan and that Japanese coal is sold in Hankow, 600 miles from tidewater and five days from Japan. Hankow is in the heart of the Chinese coal fields with a railroad tapping good coal within 359 miles, not to mention the water routes which offer nearer and cheaper transportation from other fields.

The Kaiping, Fushun, Pinghsiang and other collieries show what can be done with intelligent application of capital. Each of these and some others had hard struggles to enable them to start operations, not from the lack of financial success, but from the official and other interference and indifference.

There are opportunities for many more such companies, and the Yangtze valley should become to China what the Pittsburg and Sheffield regions are to the U. S. and England.

Mining is strictly a legitimate business and there is a minimum chance for failures if it is undertaken rightly.

The popular idea is that a mine is a hole in the ground which can produce lucrative royalties and ready cash at any time. This is unfortunately not the case, and the fact that considerable investment is necessary before any returns are forthcoming and that every day in the life of a mine is one day nearer its point of exhaustion, makes it necessary that larger profits should be won than in most any other business and that favorable conditions for obtaining these profits should exist.

Every dollar spent in and around a mine means that the most of that dollar goes toward the benefit of the labor employed and to the vendors of local supplies and consequently for the benefit of the community at large and for the increase of local tax revenue to the government.

One only has to visit any of the producing mines in China to note the general prosperity of the community and the cheerful and satisfied appearance of the inhabitants.

Chinese merchants have hitherto not become interested in mining except in a small way and in certain favored districts where the value of the business was recognised by the officials and the royalties regulated accordingly.

Regulations to promote mining which will attract capital must be drawn with the object of giving the investor an unhampered fair chance with as little government supervision as possible. Revenue to the government should be collected only on the output of the property, as every dollar spent by the investor in investigating and developing a property adds to the prosperity of the region in which the money is spent, and until a property is producing it should not be hampered by taxes and royalties.

Investments in mining are made either in proved properties or because of the indications of value in a property, and it does not follow that an investor will receive more than a fair profit from the investment commensurate with the risk involved.

There is hardly any business which calls for more careful investigation and careful initial expenditure and more skilled technical supervision than mining, and there is probably no business in which more failures are recorded on account of the lack of careful investigation and of over confidence.

Most of the famous precious metal mines in the world have been started from small beginnings by poor men, and every facility should be given the discoverer and small capitalist to exercise their rights of discovery by assisting them in their enterprises by liberal regulations.

There seems to be a lure about mining which causes men to take chances which they would not take in their own or in any other business. This is impossible to regulate, but a government can regulate the placing of shares on the market by companies which have no foundation to their claims to having valuable and workable mineral deposits.

(*Continued on page 12*)

THE DEVELOPMENT OF RAILWAYS

In view of the remarkable interest being displayed in China in regard to railway matters, it is of interest and value to record what is transpiring elsewhere, especially in countries where conditions are largely similar. The following article is from the *Rangoon Times:*
—If any justification were required for the proposition that a bold forward policy in the matter of railway development in this Empire is certain to yield a handsome return upon the outlay involved, it would be found in the remarkable results detailed by Sir T. R. Wynne in his statement to the Imperial Legislative Council. The figures are convincing enough even for the most sceptical, and show that judicious expenditure under this head always more than repays itself. Taking a period extending over sixteen years from 1896-97 to 1912-13, during the first eight years of this period of progress, receipts rose by 11 crores; during the second period they rose by 21½ crores or for the whole period by 32½ crores. This result is the best proof that could be put forward of the truth of the contention so often made in these columns that a policy of vigorous railway development in Burma would not only greatly advance the interests of the Province, but would yield splendid profits. In particular, the long-proposed project of a line connecting Burma with China—which is one of the most pressing of Provincial needs—ought to be brought out of the pigeonhole where it is becoming dust-covered, and reconsidered in the light of the facts and figures quoted by Sir T. R Wynne. We are very glad to see that the Chambers of Commerce of Manchester and Liverpool are about to bring pressure to bear upon the Secretary of State with that object, and we sincerely trust that they may be able to induce him to re-open the question, which has dropped out of view since Lord Curzon of Kedleston's suggestion that the merchants of Burma should provide the funds required for the construction of the proposed line. We entertain no doubt that the money would be forthcoming promptly if the Government of India followed the example set by the Dominion of Canada in offering land concessions along the route in return for the financial help required That such a railway is needed cannot be disputed, that it would pay well is equally certain; that its cost could be easily provided on suitable terms does not admit of doubt. The political difficulties in connection with the suggested line have undergone considerable modification within the last few years, and all that is now wanted is a bold policy on the part of the Railway Board.

The Burma Railways Company, Limited, is an enterprising concern and is under exceptionally able management, but it is hampered by the action of the Railway Board, which in its turn reflects the attitude of the Government of India We know that the Railway Board is alternately accused of extravagance and of parsimonious neglect, but the former is neither required nor desired in the case of this Province. The traffic returns of the Burma Railways last year bear eloquent and conclusive testimony to the advantages of a forward policy. The number of passengers carried on the main line and the Pegu-Moulmein and Henzada-Kyaungin extensions was 23,966,266, an increase of over two millions as compared with the previous year. The gross earnings rose to Rs. 211.76 lakhs and the working expenditure to Rs. 130.47 lakhs, leaving a net profit of Rs. 81.29 lakhs, an increase of 9½ lakhs on the figures for 1910-11. Both on the main line and on the extensions the percentage of expenses to earnings fell, and the percentage of earnings to capital outlay everywhere increased. Figures like these are very satisfactory in themselves and amply warrant the belief that if further extensions were undertaken—and especially if the construction of the through connection to China were placed in the hands of the Burma Railways Company—the financial and commercial benefit to this Province would be enormous.

There are, of course, other directions in which railway development is necessary in Burma, and it is gratifying to know that the matter is not being neglected, even if progress be slow. In the Tenasserim Division surveys have been sanctioned from Ye to Tavoy, from Tavoy to Amya *via* Myitta, from Moulmein to Three Pagodas, and from Ye to Three Pagodas. Then, also, considerable advance is being made in the construction work on the Southern Shan States Railway and if sufficient funds are forthcoming it is anticipated that the line will probably be opened up to Aungban at the 72nd mile in the spring of 1914. Reports on the projected Ta-Hapali-Nampai Nyaunglebin-Madauk and Nyaunglebin-Pado Railways were received last year, but it is not proposed to proceed with the projects at present. The Local Government recommended the construction of the Pyinmana-Myinbyin, and Alon-Saingbyin lines, reports for which were also received, but there is no early prospect of the Railway Board being able to provide the necessary funds. This is disheartening, but as we have said, if the Government of India will only be a little more liberal, and be not quite so grasping in wanting everything for itself and will consider the economic interests of investors, it can readily obtain all the money needed to inaugurate a vigorous policy of railway development.

MODERN PORT FOR SAKHALIN.

Mr. P. M. de Friedlander, the English capitalist, who is largely interested in East Siberian mining concessions and more particularly in coal mines and petroleum oil wells in the Russian section of Sakhalin, has received very welcome tidings that the Tsar has approved of certain plans submitted by him for the construction of a harbor at Alexandrovsk, on the northwestern coast of the island. Mr. de Friedlander was originally requested to prepare these plans by the Governor of Sakhalin and the Governor-General of the Priamurye, Master-of-the-horse Gondatti, and the actual work of drafting them was entrusted by him to Messrs. Hawkshaw and Dobson of Millbank House, London, who executed the task in a most efficient and elaborate manner. The plans were ready in 1911, but various formalities were necessary before they could be acted upon Following the Tsar's approval, they were submitted to a committee which was convened last summer during Governor-General Gondatti's visit to St. Petersburg and were duly accepted. Work on the new harbor will commence forthwith.

The importance of the projected enterprise from an economic standpoint can scarcely be exaggerated. The effect of creating an up-to-date port at Alexandrovsk will be to open up an almost fabulously rich coal bearing country in the hinterland, which in turn will revolutionize the entire coal trade of the Far East. Not only is the quantity of coal available enormous, and capable of being easily mined, but its quality has been recognized by experts as fully equal to the best Cardiff steam coal. Hitherto the business of mining this coal has been carried on in a very desultory manner, the absence of a harbor on the west coast and the consequent difficulty in shipment having constituted the most serious obstacle to successful development in the past. In the opinion of the British Consul at Vladivostok once these obstacles can be overcome by the construction of an artificial harbor, the industry should have a good future.

A great prospective market for the Sakhalin coal is the Maritime Province of East Siberia, which in 1910 imported 41,852 tons from China and 34,146 tons from Japan, the principal purchasers being the Government departments and the Ussuri Railway. It should be easy for this high-class Sakhalin coal to oust all foreign coals from the coals from the above market, and also to take the place for private and industrial use of local coal.

But the prospective market for Sakhalin coal, when the new harbor is ready, need not be restricted to Russian territory, for in the opinion of experts, it should be possible to lay down this coal at, say, Yokohama at a rate per ton considerably lower than that asked for Japanese coal which, moreover, is of decidedly inferior quality. Indeed the demand for Sakhalin coal hereafter from steamship companies doing business in these waters bids fair to be enormous.

Mr. de Friedlander states that the natural condition for a harbor at Alexandrovsk are in every respect excellent. The average depth of water at low tide is 47 feet, with a rise of about six feet at high tide. Mr. de Friedlander naturally feels gratified that his plans should have been given the preference over those of anybody else, and looks forward with confidence to the future progress of Russian Sakhalin in the wake of this important projected improvement.

THE IMPORTANCE OF THE MINING INDUSTRY TO CHINA

(*Continued from the previous page*)

In countries where the government gives investors much aid and information through their geological surveys, by building roads and giving similar assistance, investors will naturally be willing to pay higher royalties and taxes, as their contributions are indirectly spent for the benefit of the mining industry.

There is probably no country in the world to-day of which so little general and detailed information about its mineral resources is available as China and the present time is most opportune for the inauguration of a practical and business like geological survey which would have for its objects the study of the known mineral districts and the publication of results. In many cases the study of the occurrence of coal and oil would lead to the discovery of further deposits and to the great advantage of the country at large.

Furthermore, the great advantage to the country of the detailed topographic maps necessary for the study of its geology would be that these maps could be used for the purposes of irrigation, reclamation, railway and transportation routes, agricultural and forestry development, military and many other uses which would repay the government many times over for the original cost.

No one who has travelled in China but is impressed with the possibilities for its development, and no one who admires the Chinese doubts that they will achieve a stable government on modern lines. For the new government there is no work of greater benefit to the country than the intelligent promoting of the development of its mineral resources.

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THE PROPOSED MONGOLIAN AGREEMENT

When the last issue of the FAR EASTERN REVIEW went to press the House of Representatives at Peking was considering the proposed agreement between China and Russia regarding Mongolia. Among the members of the House considerable feeling was shown, and there was strong criticism of what was described as the "high-handed action of Russia," in trying to obtain from China something which she ought not to grant, and to which Russia was not entitled.

The House discussed the matter in secret session, and after argument extending over two sittings proposed certain modifications to the agreement—modifications which it is not likely the Russians will accept.

The agreement submitted to the House consisted of six articles, and embodied the Urga Protocol* with a few immaterial alterations. The proposed agreement is as follows:

China and Russia with the object of obviating misapprehensions which might possibly arise from the present situation in Mongolia have agreed upon the following stipulations:

1—Russia recognises Mongolia to be an integral part of the territory of China and hereby explicitly undertakes not to seek to interrupt the continuity of its territorial integrity: Russia further undertakes to respect China's rights of every description which heretofore have existed in consequence of this territorial integrity.

2—China undertakes not to change the system of local self-government which has hitherto existed in Mongolia, and since the Mongolians in Outer Mongolia are responsible for the defence of, and the maintenance of order within their boundaries, they are granted the sole right to organise troops and police. They are also granted the right to oppose colonisation by others than Mongols within their boundaries.

3—Russia on its part undertakes that with the exception of Consulate Guards it will not despatch troops to Outer Mongolia and also undertakes not to carry out colonisation measures in Outer Mongolia, and further that with the exception of such officials as are allowed by treaty for the Consulates not to place other kinds of officials as Russian representatives.

4—China desiring to employ its rights in Outer Mongolia in a peaceful manner hereby declares that it will accept such principles of procedure as Russia as mediator may lay down in accordance with the objects set forth in the foregoing stipulation for China's treatment of Outer Mongolia and that the Chief Official of the Central Government there shall regard himself as having the character hitherto attaching to the local official in any part of China.

5—The Government of China, out of consideration for the mediation of the Russian Government agrees to give to Russian subjects in Outer Mongolia the commercial privileges to be enumerated here below. (Here follows the 17 articles of the Urga Protocol.)

6—Hereafter in the case of agreements between Russia and Outer Mongolia relating to changes in the international relationships of that region it is necessary that China and Russia consult direct and only after the Chinese Government has given its consent shall they become effective

The amendments proposed by the House were:

In Article 2 it was desired to delete the words giving Mongolia the right to raise troops, though it was agreed to allow her to organise a police force.

In Article 3 it was desired to delete the words "with the exception of Consular Guards."

In Article 6 it was desired to remove the necessity of China consulting Russia with regard to international questions regarding Mongolia.

The remainder of the Articles were agreed to.

*The Urga Protocol, with a Commentary thereon by Lieut. Binsteed, was published in the last number of the FAR EASTERN REVIEW in connection with an article giving a full statement of the Mongolian Question.

EDUCATION IN THE PHILIPPINES

Particular interest attaches to the periodical reports of the Director of Education in the Philippines, inasmuch as they show what progress is being made in regard to one of the most important responsibilities that America has taken upon herself in the Archipelago. Satisfactorily to fulfil her mission in the Philippines the moral elevation of the people must synchronize with material betterment.

We have before us as we write the twelfth annual report of the Director, and it is most gratifying to find that its tone generally is confident and optimistic. Great progress had been made in the attempt to improve the quality of the English taught in all schools. The important department of industrial instruction had been organized and developed to a greater extent than ever before. Special courses in farming, housekeeping and household arts, trade work, and business are offered for those pupils who desire to do more industrial work than that prescribed in the general intermediate course. These special industrial courses are replacing the general course in many intermediate schools. Already 40 schools are giving the farming course, 61 are giving the housekeeping course, 39 are giving the trade course, 47 the teaching course, and one the business course, as compared with a total of 204 conducting the general course.

As is at once evident, with requirements so definitely fixed for industrial work in the schools, the great majority of the pupils who are enrolled must be engaged in some branch of this work. An examination of the figures included among the statistical tables of the report shows that of the total enrollment of 235,740 boys and 138,842 girls during the month of February, 1912 (an average month), 216,290 boys and 125,203 girls —91 per cent. of the entire monthly enrollment—were doing some form of industrial work,

In regard to the teaching force a decided improvement was to be noted in

the personnel, both American, and Filipino. With few exceptions primary instruction was now handled by Filipinos and a large proportion of the intermediate classes had also been handed over to them. It has throughout been the wise policy of the Bureau to place upon the Filipinos increased responsibilities as they became capable of bearing them.

As in many other Departments, the great development of the work has caused increased financial demands, and the report states that much further progress cannot be made until more funds are placed at the disposal of the Bureau of Education. The teachers were paid less than they would receive in private business or in other Government bureaus. With reason it is urged that they might be provided for more generously. Very satisfactory progress appears to have been made in connection with the provision of suitable school buildings, though the financial requirements in this connection were a source of some anxiety.

Study of this report can be confidently recommended to the Government of China. Many of the problems with which the Philippines Bureau of Education is so successfully coping, are confronting the Republic and it is obvious that the experience gained by the Bureau would prove of great value to Chinese educationalists. It will be readily admitted that there are few problems in China of more importance than the education of the rising generation, which will inherit vastly wider political responsibilities than did their forbears. It is eminently desirable that the activities of those into whose hands the educational destinies of the country will be committed should be directed into the best channels, and a careful investigation of progress in other places where conditions are in many respects similar will enable pitfalls to be avoided and the best results most quickly to be obtained.

THE MONTH IN CHINA

Politics almost engrossed attention in China during June. The tension between the Central Government and the Parliament showed little sign of relaxing, and the latter was not willing to accept the Russo-Chinese Agreement in regard to Mongolia. The Senate finally decided to return to the Government the despatch requesting the House to investigate and register the Quintuple Loan, but the Government refused to receive it on the ground that the resolution deciding to return the despatch had been improperly passed.

The Government removed from office the Tutuh of Kiangsi, Li Lieh-chun, and appointed Hu Han-min, Tutuh of Kwantung, as commissioner with Mr. Ivan Chen to proceed to Darjeeling to negotiate with the British authorities in reference to Tibet. The imminent retirement from office of the Tutuh of Anhui, Poh Wen-wei, was also foreshadowed, and it was hinted that Tang Yen-kai, Tutuh of Hunan, would not hold his post much longer. These four Tutuhs, it will be remembered, were outspoken in their condemnation of the Government's alleged complicity in the murder of Sung Chiao-jen and of the manner in which the Quintuple Loan was concluded.

Mr. J. L. Chalmers, Statistical Secretary of the Inspectorate General of Customs, issued his report on the foreign trade of China for 1912. This interesting and valuable report shows that the revenue from Customs dues surpassed the record collection of 1911 by Hk. Tls. 3,770,786, while the whole value of the trade showed an increase over the preceding year of 12.6 million taels. It was, of course, already known that in spite of the fact that political conditions in China were far from normal during 1912, the trade results were surprisingly good, but Mr. Chalmers' report affords official support to those who expressed confidence in China's recuperative powers.

Tsen Chen-hsuan resigned the post of Director-General of the Hukuang Railways, and the Vice-Minister of the Board of Communications has taken over the duties appointed. It was hoped that the conclusion of a satisfactory arrangement in regard to the Hukuang Loan would lead to immediate activity, but this hope has not been realised. However, survey and other preliminary work is proceeding, and it is hoped that, when political conditions have definitely settled down, the work will be pushed on with.

The survey of the Pukow-Sinyang Line, it is understood, has been completed, and the Chinese papers have published what purport to be the main terms of the agreement for the construction of this line. Matters in connection with the Lung-Tsing-U-Hai Railway are progressing steadily. Negotiations are being carried on in regard to other lines, and there is little doubt that a settlement of the more important political problems confronting China would be followed by an immediate development of activity in regard to railway construction. We publish in this issue the annual reports of the Peking-Mukden Railway and the Shanghai-Nanking Railway, both of which show that steady progress is being made.

The Government presented a Budget for the first six months of 1913 which showed:—total receipts $51,336,880, total payments $168,823,452 and deficit $117,486,572.

Great criticism was directed at the Government after the presentation of the Budget, and there have been indications that there is some possibility of the more important parties in Parliament combining to denounce the Government's financial policy, especially in regard to the conclusion of the Austrian Loans. A motion of impeachment was expected to be presented early in July.

U. S. RAILWAY BUSINESS FOR FEBRUARY

Railway business in the United States for February was slightly greater than for the corresponding month of 1912. This in indicated in statistics compiled by the Bureau of Railway Economics from the reports of steam railways, operating over ninety per cent. of the mileage of the country to the Interstate Commerce Commission.

The returns for February average as follows per mile of line: Total operating revenues per mile amounted to $1,015, which is 5.3 per cent. greater than in February, 1912; operating expenses per mile amounted to $756, or 6.4 per cent. greater than in 1912; net operating revenue per mile amounted to $259, or 2.4 per cent. greater than in 1912. Taxes amounted to $46 per mile, an increase of 5.7 per cent. Operating income, which is what is available for rentals, interest on bonds, appropriations for betterments, improvements, and new construction, and for dividends, after the payment of operating expenses and taxes, amounted in February to $212 per mile. This represents an increase over February 1912 of less than four dollars a mile, or 1.8 per cent.

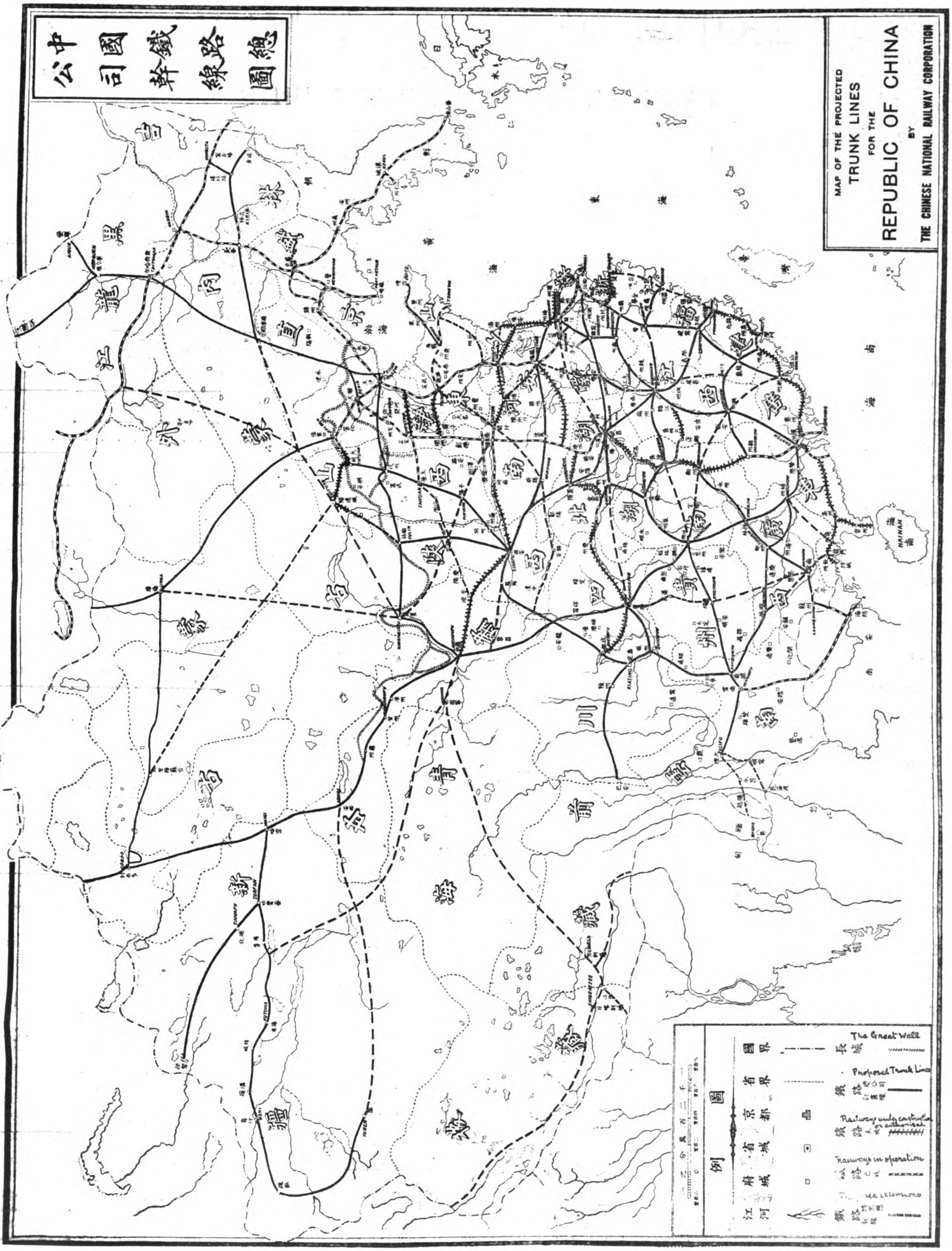
As February contained twenty-nine days in 1912 and but twenty-eight days in 1913, the returns for this month of the current year, other things equal, would be somewhat less than for February, 1912. A comparison of operating income on the basis of income per mile per day eliminates the effect of the extra day in 1912. On this basis operating income per mile per day averaged $7.58 in February, 1913, $7.19 in 1912, and $6.49 in 1911.

The railway returns here presented are for the month ending February 28, and do not reflect the recent impairment of railway operating conditions on account of floods in the middle West and the South. It will not be possible to trace the effect of these impaired conditions in the railway record until the returns for March, April and later months are available.

MINERAL PRODUCTS AND CURRENCY REFORM

The Currency Reform Committee is now actively engaged in evolving a constructive scheme for the carrying out of the stupendous task of unifying the coinage of the country. As accurate data in regard to the output and estimated quantity of the various metals of the country is absolutely necessary in determining the suitability of any standard to be adopted, the Committee have written to the Board of Industry and Commerce asking for detailed information in regard to the status of mines containing the following: silver, copper, iron, tin, nickel, lead, zinc, etc.

The Board has searched among the records and documents for the data, but finding that the records are not complete, has issued instructions to all the provinces to furnish such data and report them on specially prepared forms.


中國鐵路總公司幹線圖
MAP OF THE PROJECTED
TRUNK LINES
FOR THE
REPUBLIC OF CHINA
BY
THE CHINESE NATIONAL RAILWAY CORPORATION
HAINAN
The Great Wall
Proposed Trunk Lines
Railways in operation

PEKING-MUKDEN RAILWAY

ANNUAL REPORT AND ACCOUNTS

General Report

Mr. Li Tsoi-chee, the Managing Director of the Peking-Mukden Line, has issued his report for 1912. He says:

The designation of the Railway has been changed. The old style of Imperial Railways of North China has given place to the new name of Chinese Government Railways, Peking-Mukden Line. So far, the change is principally one of name, for the administration of the Director continues, as before, and remains under the control of the Board of Posts and Communications in Peking.

From the beginning of the Revolution, and before the creation of a form of Republican Government, the country was in a chaotic state, and for a time railway operations were carried on only a great personal risk and danger. In consequence, the loss sustained by this line was considerable. After the historic change had been successfully made, and although order had been somewhat restored in the country, Manchuria was visited with famine, and inundations broke out in the Province of Chihli, resulting in a general depression of trade throughout this part of the country. The traffic was then so stagnant that all hope was almost given over of being able to bring the earnings to the usual figures of previous years, but thanks to the untiring efforts and energy of the entire staff, on the general revival of trade, an unprecedented result was obtained. Besides grain, the earnings from coal traffic and salt show most notable increases.

The traffic earnings for 1912 are the highest on record for this railway.

The results of the year's working are compared with those of the previous twelve months in the columns below:—

	1911 $	1912 $
Earnings	11,668,627.89	13,183,638.51
Working Expenses .	3,651,132.53	3,820,657.23
Balance after paying Working Expenses	8,017,495.36	9,362,981.28
Ratio of Working Expenses to Earnings . . .	31.3%	28.9%

Mileage.—The mileage open to traffic is 605.76 miles.

Loans.—On 1st August, 1912, the Imperial Chinese Railways 5% Gold Loan of 1899 was reduced by the amount of the Eighth Drawing of £57,500 to £1,840,000.

The service of the Gold Loan of the South Manchuria Railway has also been duly met.

Exchange.—The monthly remittances to London in settlement of Loan service obligations were made at the average rate of 2/10⅝ per Tientsin Tael.

Staff.—At the close of a momentous year, the Director gladly avails himself of this opportunity to thank all grades of the staff for their loyal devotion to duty and hearty co-operation in the service.

Statement of Accounts for the Year Ended 31st December, 1912

No. 1 CAPITAL AUTHORISED AND CREATED

DETAILS	Capital Authorised: Stock and Shares	Capital Authorised: Loans	Capital Authorised: Total	Capital Created: Stock and Shares	Capital Created: Loans	Capital Created: Total
	$	$	$	$	$	$
Chinese Government and Chinese Shareholders	21,994,428.57	—	21,994,428.57	21,994,428.57	—	21,994,428.57
Under Loan Agreement 1899, £2,300,000	—	27,600,000.00	27,600,000.00	—	27,600,000.00	27,600,000.00
Under Japanese Loan Agreements South Manchuria Railway Loan, 1909 Gold Yen 320,000 . . .	—	377,142.86	377,142.86	—	377,142.86	377,142.86
	$21,994,428.57	27,977,142.86	49,971,571.43	21,994,428.57	27,977,142.86	49,971,571.43

No. 2 STOCK AND SHARE CAPITAL CREATED SHOWING PROPORTION ISSUED

	Amount Created $	Amount Issued $	Amount Unissued $
Chinese Government and Chinese Shareholders	21,994,428.57	21,994,428.57	—
	$21,994,428.57	21,994,428.57	—

No. 3 CAPITAL RAISED BY DEBENTURE STOCK

Chinese Government Peking-Mukden 5% Railway Loan formerly called Imperial Chinese 5% Railway Loan, 1899 (original amount of Loan £2,300,000).

	£	$
Existing at 31st December, 1911	£ 1,897,500	22,770,000
Bonds of Eighth Drawing paid off	57,500	690,000
Existing at 31st December, 1912	£ 1,840,000	22,080,000
Of which there was invested in the Hongkong & Shanghai Bank, London, at 31st December, 1911.	£ 85,251.0.9	1,023,012.48
Less Withdrawals	£ 40,255.5.4	483,063.20
Leaving invested in the Hongkong & Shanghai Bank, London, at 31st December, 1912.	£ 44,995.15.5	$ 539,949.28

South Manchuria Railway Loan, 1909 (original amount of Loan G. Yen 320,000.00).

Existing at 31st December, 1912 . . . . G. Yen 266,666.70

No. 4

RECEIPTS AND EXPENDITURE ON CAPITAL ACCOUNT

Dr.

To Expenditure	Total to 31st Dec. 1911 $	Amount expended in Year 1912 $	Total to 31st Dec. 1912 $
Lines open for Traffic . . .	47,245,485.01	1,221.46	47,246,706.47
Authorised by High Court of Chancery	1,849,711.38	538,677.80	2,388,389.18
New Steamer.	336,475.78	—	336,475.78
	$49,431,672.17	539,899.26	49,971,571.43
Balance			Nil
			$49,971,571.43

Cr.

By Receipts	Total to 31st Dec. 1911 $	During Year 1912 $	Total to 31st Dec. 1912 $
Shares . .	21,994,428.57	—	21,994,428.57
Debenture Stock .	27,600,000.00	—	27,600,000.00
South Manchuria Rly. Loan . .	377,142.86	—	377,142.86
			$49,971,571.43

No. 5

DETAILS OF EXPENDITURE ON CAPITAL ACCOUNT

Rolling Stock	$413,274.94
Tongshan Works	47,140.04
Shanhaikwan Bridge Works.	6,351.44
New Head Office Buildings .	5,127.83
Stations, Yards and Sidings .	67,536.44
Bridges	468.57
	$539,899.26

No. 6

EXPENDITURE ON CAPITAL WORKS PAID FOR FROM REVENUE

Betterments.	
Buildings at Chien Yeng Men Station, Peking	26,607.92
Flood protection works in Hsin Min Fu district . .	65,729.74
Railway Extension to Mukden City.	89,810.63
Locomotive Sheds	95,066.82
Staff Quarters	23,280.92
Miscellaneous	74,078.25
Expended during Current Year	374,574.28
Expended in Previous Years.	8,983,970.27
	$9,358,544.55

No. 7 REVENUE ACCOUNT

Dr.

To Maintenance of Way, Works and Stations as per Abstract A	969,948.83	
To Locomotive, Carriage and Wagon Expenses as per Abstract B	1,796,162.04	
To Traffic Expenses as per Abstract D	511,345.46	
To General Charges as per Abstract E	543,200.90	
		3,820,657.23
To Balance carried to Net Revenue Account		9,362,981.28
		$13,183,638.51

Cr.

By Earnings:	
Passengers	5,257,591.89
Goods	6,850,353.37
Military Traffic	77,921.59
Miscellaneous Receipts	665,957.03
Chinese Government Traffic	331,814.63
	$13,183,638.51

No. 8 NET REVENUE ACCOUNT

Dr.

To Debenture Loan, Eighth instalment repaid	690,000.00
To Debenture Loan, Interest	929,383.05
To Chinese Shares, Interest	3,360.59
To S.M.R. Loan, part capital repaid	18,222.21
To S.M.R. Loan, Interest	14,355.16
To Paid to Chinese Government	6,320,263.31
To Shipping Department	39,230.24
To Tongshan College, Upkeep	72,328.72
To Bonus to Employees	182,107.51
To Betterments, being amount taken from Revenue for Capital Works	374,574.28
To Extraordinary repairs	84,751.91
To Balance	6,111,646.42
	$14,840,223.40

Cr.

By Balance forward from last year	5,477,242.12
By Balance transferred from Revenue Account	9,362,981.28
	$14,840,223.40

No. 9 GENERAL BALANCE SHEET

Dr.

Capital Account, Balance per No. 4	Nil
Salaries and Wages due	165,693.94
Sundry Creditors	86,698.45
B.R.A. Balance taken over	3,293,107.44
Net Revenue A/c. Balance at Credit per No. 8	6,111,646.42
	$9,657,146.25

Cr.

Hongkong and Shanghai Bank, London		
Loan Funds, on Deposit Receipt	£30,000.	
Loan Funds, on Current Account	14,995.15.5	
		539,949.28
Revenue Funds, on Deposit Rect	35,000.	
Revenue Funds, on Current Account "A"	33,465.16.9	
		821,509.04
To meet repayment of Loan Capital		229,716.47
Cash with foreign Banks in China		
On Deposit Receipt	$1,495,714.29	
On Current Account	1,283,548.89	
		2,779,263.18
Cash on hand in Head Office		280,769.80
Stores		2,847,320.49
Investments		1,199,289.09
Traffic Accounts due to the Railway		670,219.48
Other Accounts due to the Railway		166,075.09
Accounts due by other Railways		122,953.33
		$9,657,146.25

Wm. Henderson, C.A.,
Chief Accountant.

ABSTRACTS

A. Maintenance of Way, Works and Stations.

	Year ending 31st December, 1912		Year ending 31st December, 1911	
Salaries, Office Expenses and General Superintendence	166,596.97		191,683.94	
Maintenance and Renewal of Permanent Way:—				
Wages	323,153.13		329,974.67	
Materials	326,710.27	649,863.40	283,969.40	613,944.07
Repairs of Bridges.				
Wages	16,146.02		13,432.65	
Materials	25,881.54	42,027.56	20,197.26	33,629.91
Repairs of Stations and Buildings.	111,460.90		90,763.63	
	$969,948.83		$930,021.55	

B. & C. Locomotive Power and Rolling Stock Repairs.

	Year ending 31st December, 1912		Year ending 31st December, 1911	
Salaries, Office Expenses and General Superintendence	156,333.38		157,039.29	
Running Expenses.				
Wages connected with working Locomotive Engines	164,579.43		153,001.77	
Coal	476,790.53		438,469.72	
Water	52,473.05		46,070.46	
Oil, Tallow and other Stores	77,741.39	771,584.40	66,342.09	703,884.04
Maintenance and Renewal of Locomotives and Machinery:—				
Wages	341,583.45		311,673.83	
Materials	132,528.76	474,112.21	99,723.04	411,396.87
Repairs and Renewals of Cars:—				
COACHING VEHICLES:				
Wages	94,403.73		81,297.64	
Materials	58,631.95	153,035.68	59,124.33	140,421.97
GOODS VEHICLES:				
Wages	94,374.82		71,136.66	
Materials	90,154.43	184,529.25	91,868.81	163,005.47
Cleaning Carriages and Oiling		44,612.68		42,004.48
		1,784,207.60		1,617,752.12
Steam Ferry at Newchwang		11,954.44		11,338.51
		$1,796,162.04		$1,629,090.63

D. Traffic Expenses.

Year ending 31st December, 1912 $		Year ending 31st December, 1911 $
97,732.01	General Superintendence	95,290.60
252,402.86	Wages of Station Staff	223,268.12
74,043.76	Wages of Train Staff	62,180.45
77,218.85	Lighting and Small Stores	57,836.35
.12	Wagon Covers, Ropes, etc.	26.89
9,947.86	Station Fittings and Furniture	7,022.85
511,345.46		445,625.26

E. General Charges.

Year ending 31st December, 1912 $ Cr.		Year ending 31st December, 1911 $ Cr.
254,226.56	General Superintendence	250,502.31
70,610.56	Accountant's Department	68,106.06
79,775.01	Stores Department	77,064.89
42,399.97	Medical Department	100,957.40
6,261.95	Rents of Buildings and Lands	11,287.52
97,949.40	Police	111,765.52
156,564.69	Telegraph Department	151,989.01
80,687.65	Stationery and Printing	58,157.73
4,031.19	Compensation	3,874.42
58,434.96	Sundries	35,639.47
850,941.94		869,345.23
307,741.04	Cr. Interest, &c.	222,950.14
543,200.90		646,395.09

Earnings.

Year ending 31st December, 1912 $		Year ending 31st December, 1911 $
5,257,591.89	Passengers	4,336,997.08
6,850,353.37	Goods	5,931,056.62
77,921.59	Military Traffic	53,092.51
665,957.03	Miscellaneous Receipts	399,094.18
331,814.63	Chinese Government Traffic	948,387.50
13,183,638.51		11,668,627.89

Report on Permanent Way Department

Miles of Main Line Track		605.760 Miles.
Miles of Sidings, permanent	150.662	
temporary	8.312	
	Total	158.974 "
Increase of Main Line		nil. "
Increase of Sidings, permanent	3.018	
temporary	0.532	
	Total	3.550 "

New sleepers put in for maintenance
- (a) 8 ft. sleepers . . . . . 221,567.
- (b) Crossing timbers . . . . 2,601.

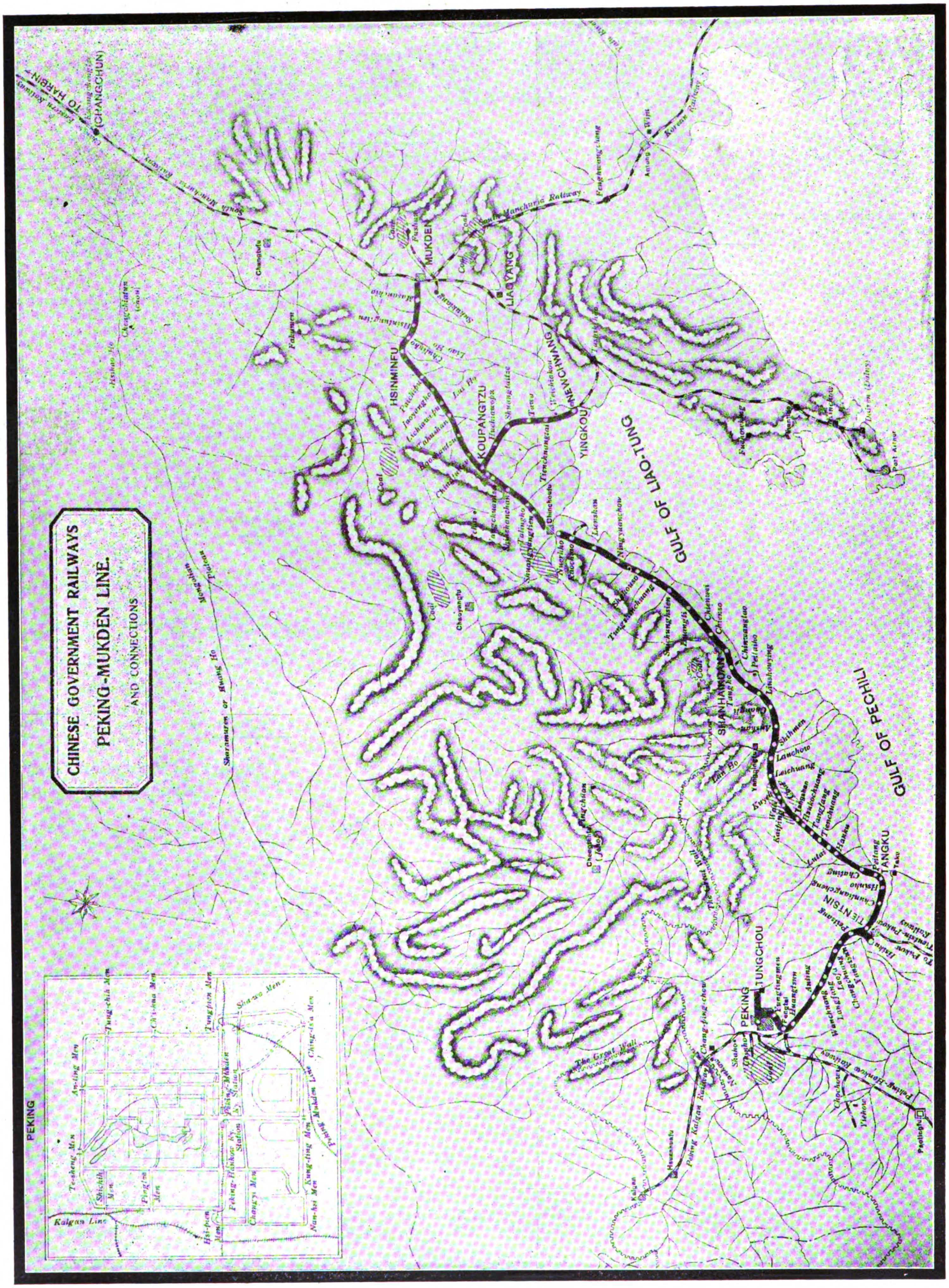
Rails changed.
- 128 Old section 60 lbs. broken or defective
- 19 New section, 60 lbs. " " "
- 11 Standard 85 lbs. " " "
- 1 85 lbs. Hanyang " " "
- 1 Japanese 60 lbs. " " "

385 ft. of old section 60 lb. track replaced by new section 60 lb.

550 ft. of worn 85 lb. track relaid with new 85 lb.

Fangs of ballast used for maintenance	16,139
Fangs of ballast used for new work	8,356
Floor ties renewed	4,776

Probable renewals for next year.
- (a) 8 ft. sleepers 266,000
- (b) Crossing timbers . . . 3,960
- (c) Floor ties 7,100


CHINESE GOVERNMENT RAILWAYS
PEKING-MUKDEN LINE.
AND CONNECTIONS
GULF OF LIAO-TUNG
GULF OF PECHILI
TO HARBIN
(CHANGCHUN)
South Manchuria Railway
MUKDEN
LIAOYANG
HSINMINFU
KOUPANGTZU
NEWCHWANG
YINGKOU
SHANHAIKWAN
TANGKU
TIENTSIN
TUNGCHOU
PEKING
The Great Wall
Port Arthur
PEKING
Kalgan Line

In connection with track renewals it is to be remembered that our track is laid with 85 lb. rails from Peking to Tongshan and from thence to Mukden and Yinkow we only have 60 lb. rails. This difference in weight and strength of rail on the main line causes serious difficulties in the economical working of our traffic, chiefly in restricting the weight of through trains to the capacity of the engines on the light rail. It also limits our car axle load for the whole line and it also seriously interferes with schemes for heating our trains from the locomotives.

It is therefore strongly recommended that the line between Tongshan and Mukden be relaid with 85lb. rails at an early date, and that the first section of 95 miles between Tongshan and Shan-hai-kuan be undertaken next year—1913.

New bridges completed:—

Bridge No. 141.—One concrete pier built to replace the old one which was blown up and 2 new girders erected to replace damaged ones.

Bridge No. 275.—One span added and bridge converted into a reinforced slab top.

Bridge No. 58 (Hsinminfu line) 17 spans of 30 ft.

Bridge No. 61 (do.) 2—20 ft. spans added.

Bridge No. 61a (do.) 2—20 ft. spans.

Fangs of rubble used for protective work . . . . 12,825 fangs

Probable extra Bridge Work, etc., necessary to cope with floods.

Re-forming and pitching part of bank and raising part of track between Yangtsun and Lofah . . . .

Bridge No. 52. Converting timber piers to concrete . . . .

Liu Ho dams, probable extension . . . . .

Fangs of Earthwork executed.

(a) New Work—152,869 fangs (including 113,114 fangs Mukden City extension).

(b) Repairs 93,200 fangs.

Platforms extended.

None, but Tientsin East down platform had 980 feet wall built to make both sides available.

New Buildings erected.

Chienmen (Peking), Chinese Post Office (2 stories)	sq. ft.	5,856
Tientsin, New Engine Shed including Loco. office, etc.	„	28,038
Chang-kui-chuang, Station building	„	914
Tong-shan Works, Timber drying shed	„	4,000
Tong-shan Works, Painting shop extension	„	9,540
Kaiping, U. S. Army barracks . .	„	2,203
Wa-li, U. S. „ „ . .	„	1,919
Tang-ho, Engine shed and rooms for drivers	„	2,309
Shan-hai-kuan Bridge Works, carpenters' shop	„	2,460
Huang-ku-tun, Engine shed extension and accessory buildings .	„	10,077
Total sq. ft. of various buildings and quarters erected and extensions made along the line .	„	24,120
Total	sq. ft.	91,436

Signals erected.

Tientsin, Dwarf semaphore.

Tang-ho, Standard semaphore for Chinwangtao branch.

Chienso, 1 Reinforced concrete signal post.

Chu-liu-ho, 4 „ „ „ „

Quarry opened.

Small quarry opened at Shuang-yang-tien and siding laid to it.

Heavy works executed.

Bridge No. 106 (Yang-ho) 350 ft spur built and pitched with waste ashlar and rubble on willow mattresses.

Tientsin, New Engine Shed for 18 engines with necessary tracks, coaling and watering arrangements and yard. Shed is rectangular and has six tracks.

Near Ning-yuan-chow, Pitched dam round village at 113.75 mile.

Between bridges Nos. 222 and 223. Training dam and raising river bank near No. 222 bridge.

Bridge No. 264. Three training spurs.

Chin-chow, new station approach road.

Bridge No. 275, I span added.

New bridge No. 58 at Chu-liu-ho built and old No. 58 bridge filled up.

Chin-chow and Yinkow, new roof on engine sheds.

Liu Ho, 46,475 lin. ft. of dams built.

Bridge No. 141, Repairs.

Huang-ku-tun, Engine shed extended 186 ft. 2 tracks with heating and all accessories.

Bridge No. 61, extended 2 spans of 20 ft. (M. D. line).

Bridge 61a, 5 spans of 20 ft. built.

Mukden City yard. Earthwork filling.

Foreshore protection.

Siku river bank repaired and pitched for about 1,000 ft.

Yinkow, 367.41 fangs of rubble used.

Wharfage.—Nothing new, but 19,000 sq. ft. of decking renewed on Tongku Wharf.

Painting executed for maintenance.

115 Bridges painted.

Tientsin, Tongshan and Pei-tai-ho Overbridges.

Tientsin Central Station Subway.

Tangho Turntable.

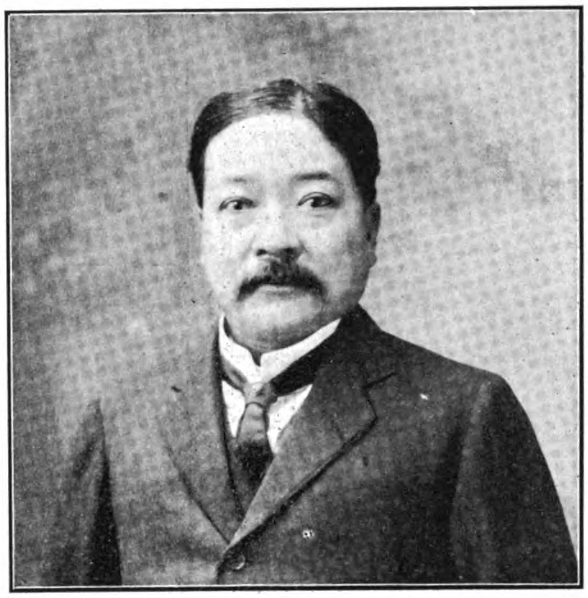
Yinkow ferry boat and pontoons.

Staff quarters (about 30) painted.

Shan-hai-kuan station buildings.

Sar-hou-sou, Ning-yuan-chow, Lien-shan and Chin-chow station roofs and water tanks.

All signal posts, notice, nameboards, etc.



Mr. Li Tsoi-chee, Managing Director, Peking-Mukden Line

Water supply works.

Tientsin, New main to tank and hydrant at East end, 570 ft. 4" and 485 ft. of 1½" pipe.

New Loco. shed and yard. One 5,600 gall. tank, one 4,300 gall. tank, one water crane, 110 ft. of 8" pipe, 562 ft. of 3", 35 ft. of 2" and 20 ft. of 1".

Carriage washing hydrant. 460 ft. of 2" pipe.

Hsü-ko-chung, New steam pump and 180 ft. of 4" pipe.

Chang-li. Pipe connection made to admit pumping direct from Yin-ma-ho to subsidiary tank at Chang-li station.

Hsiao-ling-ho (near Chinchow) New pump foundations built.

Kao-pan-tze, 1 new 6" borehole added.

Works in progress.

Tientsin Engine shed and turntable completion. Sidings at East end of station.

Mukden City Yard. Earthwork filling.

Accidents during the year.

Employees killed . .	6	Injured . .	0
Passengers killed . .	17.	Injured . .	24
Trespassers killed . .	49.	Injured . .	25
Passengers drowned .	1.		

Collisions while shunting in station yards .	5
Engine and Car derailments in station yards	80
Train derailed bet. Lei-chuang and Lanchow during Lanchow uprising . . .	1
Engine derailed on Chang-li weir during flood	1
Train separated	4
Train on fire	3
Bridges blown up	2

On February 3rd, No. 73 train was wrecked at No. 141 bridge, 11 passengers were killed and many injured. The girders of the Bridge were evidently blown up by dynamite, one span was practically destroyed and another so badly damaged that it had to be changed.

On Sept. 15th the rails and girders of No. 51 bridge, on the Hsinminfu line, were damaged by explosion, a piece of rail 4 ft. long was blown away some distance, and the up flange of girder badly bent. The damage was not discovered and No. 74 train passed over without either engine or cars being derailed, after which the bridge was repaired.

Rainfall and floods.

General rainfall averaged 25.30 inches, but at Fengtai 6.75 inches fell in 10 hours on May 17.

10.00 inches rainfall averaged 28 hours on July 5 and 6.

9.25 inches rainfall averaged 50 hours on July 21, 22 and 23. There was no serious damage done by floods on the Railway excepting between Tientsin and Peking.

At the end of July the three rivers Lung Ho, Feng Ho and Pei-Ho crossing the line between Yangtsun and Lofa were all in heavy flood and broke their banks. At the same time the Hun Ho, running roughly parallel to the line, broke its bank and swelled the Lung Ho and Feng Ho. The country between Tientsin Central and Lo-fa was practically all under water.

Water was flowing over rail to a depth of two inches for a half mile and over the ballast for another mile but was prevented from cutting out the bank. On July 31st when the flood was about at its highest a strong gale got up and a similar state of affairs occurred a few days later. These two gales did a great amount of damage to the pitched bank between Yang-tsun and Chang-chuang, but stone was obtained in time and thrown down to prevent the track being undermined. The flood was the highest experienced at this part of the line since it was built in 1896.

BRIDGE WORKS, SHANHAIKUAN

The tonnage of Work turned out was as follows:—

Girders:—

3. 50 ft. Clear Deck Spans	Tons	63.	0.	0.	0
35. 45 ft. „ „ „		513.	7.	2.	1
9. 30 ft. „ „ „		73.	9.	3.	27
1. 20 ft. „ „ „		4.	1.	0.	24
6. 20 ft. „ Differdange		19.	19.	0.	23
	Total tons	673.	17.	3.	19

Special Work, Tanks, etc.:—

1. 16'×7'×8' Water tank	Tons	2.	13.	0.	8
8. 4'×4'×2' Steel oil tanks for K. P. T. Workship . . .		2.	11.	0.	24
8. 4'×4'×4' Steel oil tanks for K. P. T. Workship . . .		3.	14.	0.	6
2. 8'×4'×4' Steel oil tanks for K. P. T. Workship . . .		1.	13.	1.	9
1. 247'×30' Steel Octroi shed erected at C. M. station . . .		43.	11.	3.	4
2. 55 0" Steel engine turntables, one for Tung-Pu Railway and one for T. S. new engine shed		45.	5.	3.	4
	Total tons	99.	9.	0.	27

Miscellaneous:—

Ironwork to the extent of	Tons	74.	4.	0.	0
Total Tonnage of Ironwork done	Tons	847.	11.	0.	18

Foundry:

The Foundry has been fully employed upon castings for points and crossings, signal post fittings and turntable centres and miscellaneous castings for maintenance and construction. Iron castings to the extent of	Tons	119.	16.	1.	20
Brass castings to the extent of		1.	14.	2.	13
	Total tons	121.	11.	0.	5

New Machinery erected:—
One new sliding, surfacing and screw cutting gap bed Lathe, 11" centre×18" gap bed, erected in Fitting Shop.

General Report of Work Carried out by Locomotive and Carriage Works.

Locomotives.—General overhaul 47; Repaired at Kao-Pan-Tze 15; New boilers constructed for renewals 6; New boilers under construction 9; New fireboxes put in 8; Half sides put in 16; New firebox tube plates 13; New tube plates smoke box 2; New back plates put in 4; New sets of tubes put in 23; Boilers withdrawn from service 10; Tenders repaired at Tongshan Works 38; Tenders repaired at Kao-Pan-Tze 13.

Steamer.—Ferry boat, s.s. "Liaotung" engines and boilers overhauled.

Coach and Car Repairs.—At Tongshan Works, 1,253 Freight, 125 Passenger, and 18 Brake Vans were sent in for repairs.

At Kaopantze Works, 776 Freight, 60 Passenger and 36 Brake Vans were repaired. At the Running sheds 12,138 minor repairs were effected to Cars, and Axle Boxes of 22,865 cars were repacked.

Rolling Stock Completed.

Passenger stock.—First class Drawing room cars, 5; First class Sleepers 3; First class Diner 1; Second class Sleeper 1.

Freight stock.—20-ton Covered Goods, 50; 30-ton High side 50; 24-ton High side (mounted on old spare bogies) 15.

Rolling Stock Under Construction

Passenger stock.—First class, 6; Postal vans, 4; Kitchen car, 1, First class Sleeper, 1; Kitchen and 2nd Diner, 1.

Locomotives.—19" Moguls 6.

Tenders.—Eight wheel Bogie Tenders 4.

Improvement to Rolling Stock.

Freight stock.—Wagons fitted with Coupler locking pins lifting gear 9; Wagons converted from 20-ton to 24-ton High side 8; 30-ton freight cars 6' doors altered to 4 ½' 132.

Passenger stock.—Coaches fitted with Electric light 3; Coaches fitted with Westinghouse air Brake equipment 2; Coaches (3rd class) fitted with seats and baggage racks 7; Coaches (2nd class) fitted with piping for steam heating 2; Coaches (1st class) fitted with new type of berth 2; Coach (1st class) fitted with Stones Louvre ventilators 1; Coach (1st class) fitted with Buffet 1; Coach (private car) fitted with double roof 1; Coach (private car) rebuilt 1; Coach frames fitted with new ends, end platforms enclosed, and vestibules fitted 3; Baggage and Brake vans mail compartments added, and vans newly equipped with Engine Dynamo battery 2.

Engines, Tenders.—Fitted with Westinghouse air Brakes 3; Fitted with Westinghouse Train heating apparatus 19.

Rolling Stock Withdrawn from Service

Condemned.—Private car 1; Brake Van 1; 20-ton pony cars 3; 20-ton Covered Goods 1.

Wrecked at Bridge 141. O. W.—10-ton Coal car 1; 12-ton Coal cars 3; 20-ton Pony cars 2; 24-ton High side 1; 30-ton Covered Goods 1; 20-ton High side 1; Eight wheel Bogie tender 1.

Sold to Foreign Lines.—Engine No. 21, 1; Tender No. 53, 1.

Rolling Stock Completed for other Railways

Kirin Railway.—17" cylinder mogul Locomotive 2-6-0 type 17"×24" Drivers 4' 6" 1; Bogie tender 1.

New Rolling Stock now in Progress of Construction for Foreign Lines and Others

Kalgan Railway.—30-ton High side cars 120; 10-ton Coal cars 20; 4 wheel Brake vans 5.

Tao-Ching Railway.—30-ton High side cars. (Steel Bodies and frames) main parts of Bogies supplied by Tao-Ching Railway 100.

Asiatic Petroleum Co.—30-ton Oil tanks 7.

Varnishing and Painting.—Locomotives 25; Tenders 18; Coaches 72; Brake vans 22; Freight 1265.

Foundry Output.—Iron Castings 490.5 tons; Brass Castings 56 tons.

Average Number of Employees.

	1911	1912
Tongshan Works	2,190	2,568
Kao Pan Tze Shops	291	326
Locomotive sheds	1,571	1,614
Total	4,052	4,508

Rolling Stock Equipment at 31st December 1912

	No. of Veh.	Ton.	Axles.
Freight Stock.			
10 Ton Capacity:—			
Power Vans	6	60	
Coal Cars	271	2710	
Water Tanks	7	70	
Pig Cars	7	70	
12 Ton Capacity:—			
Coal Cars	469	5628	
Pony Cars	38	456	
15 Ton Capacity:—			
Ballast Cars	29	435	
20 Ton Capacity:			
Flat Cars	74	1480	
Ballast Cars	258	5160	
High Sided	816	16320	
Covered Goods	107	2140	
24 Ton Capacity:—			
Flat Cars	1	24	
Ballast Cars	16	384	
High Sided	156	3744	
30 Ton Capacity:—			
Ballast Cars	38	1140	
High Sided	462	13860	
Covered Goods	165	4950	
Water Tanks	3	90	
Oil Tanks	49	1470	
Timber	2	60	
Total Cars	2,974	60,251	
Passenger Stock.			
Imperial	3		12
State	3		12
Private	13		40
Directors	1		4
1st Class	28		112
2nd Class	39		156
3rd Class	100		400
Composite	17		68
Ordinary Buffet	7		28
Kitchen	1		4
Train de Luxe Equipment			
1st Class Buffet	3		12
2nd Class Buffet	2		8
1st Class Sleepers	5		20
2nd Class Sleepers	3		12
1st Class Saloon	2		8
2nd Class Saloon	2		8
Heating and Lighting	4		16
Baggage and Brake	5		20
Brake Vans.			
4 Wheel	49		98
8 Wheel	15		60
Total Cars	302		1,098
Miscellaneous.			
Wrecking Cars	9		—

Engines

Passenger class:—				
4—4—0 Cylinder	17" × 24"	4		
4—4—0 Cylinder	19" × 24"	3		
4—6—0 Cylinder	18" × 24"	13		
Freight class:			20	
2—6—0 Cylinder	17" × 24"	43		
2—6—0 Cylinder	19" × 24"	14		
2—6—0 Cylinder	16" × 24"	27		
Shunters:—			84	
2—6—2 Cylinder	14" × 24"	13		
0—6—0 Cylinder	16" × 24"	4		
2—6—4 Cylinder	17" × 24"	2		
			19	
Total Engines			128	

Tenders

4 Wheel	3
8 Wheel	83
6 Wheel	26
Total Tenders	112

Comparative Table of Rolling Stock

	1911	1912
Passenger Cars and Brake Vans	294	302
No. of Axles	1068	1098
Freight wagons of all classes	2868	2974
Tonnage capacity	57831	60555
Locomotives of all classes	124	123
Weight in Tons	5667	

Note:—Four Freight cars added to list hitherto not on register.

New Machinery Erected

Locomotive and Car Works:—Reserve steam Engine and Dynamo for Electric power house; Pneumatic moulding machine for Foundry; Block for the manufacture of pressed steel Bogies; Pneumatic plant and piping for car bogie and frame rivetting; Two sliding, surfacing and screw cutting lathes; One Bolt screwing and nut tapping machine; Two wood trimmers, and saw sharpener; One mortising and Boring machine.

General.—Vertical Boiler 4' 9" Dia. × 12' made for K. P. E. shops; All shops Tongshan works whitewashed; Erecting and Boiler Shops repainted; Timber columns of Loco Works Smith shop replaced by steel columns; Depth of South well increased by 15'.

Remarks.—Owing to the unsettled state of the country early in the year, and the large number of unemployed Southerners in Tongshan in poor circumstances, who showed no signs of moving to other places owing among other reasons to there being no or very little demand for labour anywhere in China, it was decided to re-engage these men in the railway works and so avoid the risks of local disturbance. To find these superflous hands work, six 19" mogul engines were put in hand with what material was in stock. Boiler tube fencing, electric light standards, and other work not calling for any great degree of skill were undertaken.

Delay was caused to a lot of work put in hand during the year, owing to the unusual length of time taken to fill indents calling for material from England attributable to the succession of strikes in that country.

As regards locomotives the six mentioned above were put in hand two of which are to be fitted with the Phœnix superheater. Owing to the delay in receiving material, it is improbable the first of these will be on the rails before June, the others following at intervals of a month. A shunting engine in every possible respect similar to the standard light mogul engine was ordered from the North British Locomotive Co. It is hoped that this engine may be adopted as the standard heavy shunter required by the line. The fitting of train engines and 74 class with train heating gear was proceeded with, so before long the boilers carried for this purpose in the Brake vans may be dispensed with and the space utilized for baggage.

Want of power was felt during the exceptionally heavy traffic in the autumn.

The boilers of 58 and 74 class and those of six engines of 15 class will now have to be renewed, as these engines pass through the Shops and provision is being made for this. Boiler renewal and spares will keep the Boiler Shop constantly employed during the next three or four years.

With reference to coaches it having been decided to improve the express between Peking and Tientsin, six third class coaches with teak bodies, battened seats, Westinghouse heating, and Electric light were put in hand. The mail between P. K. and S. H. K. to be improved by seven improved oregon bodies being fitted to third class coaches provided with Westinghouse heating gear and Electric light. These cars to replace those of old design now in service.

Improved electric light fittings for coaches are being introduced.

As regards freight stock construction, little of this work was undertaken. Pressed Steel bogies were successfully manufactured during the year, but have not yet gone into service. The design of frame and body of 30-ton cars was made similar to the cars supplied the Tsin-Pu Railway N.S. from Europe.

A Valiant type of fire engine similar to many in use in English railway Shops was obtained for the protection of the Works.

A pneumatic plant for coach and car frame rivetting and any bogie rivetting necessary, is now being put down in the car works. This it is hoped will reduce costs of work.

The machinery and boilers of the ferry boat "Liaotung" were overhauled, and the necessary repairs and renewals effected.

A tank Locomotive for the Hulutao Harbour Works was erected for them by Kao-Pan-Tze Shops.

TRAFFIC DEPARTMENT.

Train miles run for Revenue. . .	2,273,243
Train miles run for Construction and Maintenance	83,862
Number of Passengers carried . .	3,495,707
Number of Tons of Freight carried	3,450,393
Passenger Mileage	217,554,996
Ton Mileage.	299,419,493
Total "Passenger Ton" Mileage.	570,974,489
Average number of men employed under Traffic Manager including Police Force about 1,131 . . .	2,836

TELEGRAPH DEPARTMENT.

Length of Wires.—Tungchow and Tungchow Junction, Miles 16.65. Chienmen and Yingkow (Double Wires) 1043.50. Tientsin and Shanhaikwan (Single Wire) 175.54. Koupangtzu and Fengtien (Double Wires). 214.50. Hsinminfu and Fengtien (Single Wire) 37.37. Tientsin City and Hsiku 4.00. Tientsin Central and Tientsin East (Six Wires) 16.26. Tientsin and Tongku (Telephone) 27.00. Fengtai and Lookouchiao 3.85. Total miles 1538.67.

Electric Staff Wires.—Chienmen and Fengtien and Yingkow, Miles 521.75. Number of Messages sent, Service 188,484. Number of Messages sent, Outside 5,146. Total 193,630. Average Number of Employees 371. Number of Telegraph Stations, 77. Number of Recorders in use 123. Number of Electric Staff Stations 70. Number of Electric Staff and Tablet Apparatus, 138.

EASTERN EXTENSION, ETC., TELEGRAPH COMPANY

The seventy-ninth half-yearly ordinary general meeting of the Eastern Extension, Australasia and China Telegraph Company, Limited, was held under the presidency of Sir John Wolfe Barry, K.C.B. The general manager and secretary (Mr. F. E. Hesse) having read the notice convening the meeting and the auditors' report,

The Chairman said: The gross receipts for the half-year to Dec. 30 amounted, in round numbers, to £379,000, against £359,000 for the corresponding period of 1911, showing an increase of £20,000. Nearly £4,000 of this increase was derived from additional reserve fund investments, and the remainder (£16,000) was due to growth of traffic spread over the whole of the company's system. The working and other expenses amounted, in round numbers, to £154,000, against £150,000 for the corresponding period of 1911, showing a decrease

Head Office, Chinese Government Railways, Tientsin.

of £5,000, partly due to the expenses attending maintenance of cables having been nearly £2,000 less last year than in 1911, and partly to the general expenses of stations having been debited in 1911 with the cost of new relay and other apparatus, for which there is no corresponding item in the accounts for the past half-year. Comparing the figures for the whole year, the following satisfactory results are seen: The gross revenue for 1912 amounted to £747,000, against £689,000 for 1911, showing an increase of $58,000, while the gross expenditure for the past year was within a few hundred pounds of the expenditure for 1911. The net profit for the past half-year was roundly £206,000, and after adding £56,000 brought forward from the previous half-year, there remained an available balance of over £262,-000. The usual quarterly interim dividends of 2s. 6d per share were paid during the past year, and it is now proposed to distribute a like amount to-morrow, making a total dividend of 5 per cent. for the year. It is also proposed to pay a bonus of 4s. per share, or 2 per cent., making a total distribution of 7 per cent. for 1912. After making the usual additions to the maintenance, ships', insurance, and depreciation funds, £100,000 of the revenue balance has been transferred to the general reserve fund, making, with the contribution of £75,000 for the previous six months, a total addition to that fund for 1912 of £175,000, against £125,000 for 1911. On the other hand, the general reserve fund has been debited with £50,000, as a further provision on account of investment fluctuations, making a total provision against depreciation of £200,000, which was practically the amount of depreciation on Dec. 31 last, when the printed accounts were made up. Since that date, however, the depreciation, unfortunately, has further increased by about £7,000, which will be dealt with during the current year.

THE NEW CABLES TO THE FAR EAST.

The general reserve fund has also been debited with £86,700, the amount expended up to the end of last year in connection with the manufacture and laying of the first section of the new cables between Colombo, Penang, Singapore, and Hongkong, to which I referred when I last had the pleasure of addressing the shareholders. The cable which the Eastern Telegraph Company have arranged to lay between Aden and Colombo to connect with our new cables will probably be completed towards the end of the current year, and our further sections between Penang and Hongkong are expected to be laid and opened for traffic in the early part of 1914. The cost of our new cables will amount to about £750,000, which will be charged against the general reserve fund. The revenue balance carried forward for 1912 amounts to £27,000, against £23,000 carried forward in 1911.

GOTO ISLAND CORAL INDUSTRY.

In connection with the Goto Island coral industry, an official of the Nagasaki Kencho who recently visited the island is quoted as stating that 469 boats have their base at Tomiye, Goto Islands, and are registered there, but the number actually engaged exceeds 700.

The value of the season's catch last year was Yen 375,000, while that for May alone of this year amounts to yen 300,000. A high figure is expected to be reached this season in conse quence, although it must be said that May is always the best month. This improvement is attributed to the fact that, whereas formerly a boat carried only one net, now each occupant of the boat has a net of an improved description. The boats now in use cost about yen 700 each and the annual upkeep, including nets, of each boat, is estimated at yen 300.

The future of the coral fishing industry in Japan is looked upon with pessimism by some people in view of the large number of boats now operated, but judging from the experience of Italy, off the coasts of which coral has been regularly sought for 500 years and there is still a good yield, Japan which has for only half a century exploited this source of wealth should have a bright prospect before it. As beds are worked out so new ones must be sought and there is every reason to believe that they can be found.

CHINESE NAVAL DISTRICTS

In order properly to guard the coast line, the Board of Navy have divided the coast into three Naval Districts. In each of the Districts, a District Headquarters will be established. They are as follow:—The Northern Naval District, extends from the Yalu River to Chefoo and the mouth of the Pei-ho. The District Headquarters is to be at Chinwangtao. The Central Naval District is to extend from Chefoo to Santuao, Fukien, and the Headquarters is to be at Chungmin Island. The Southern District starts from Santuao to the Chu-kiang, or Pearl River of Kwangtung, and the Headquarters is to be at Ki'ungchowfu.

SHANGHAI-NANKING RAILWAY

ANNUAL REPORT AND ACCOUNTS

Mr. M. Y. Chung, Managing-Director of the Shanghai-Nanking Railway, in presenting the annual report and accounts, writes:—The Annual Accounts and the Departmental Reports for the calendar year of 1912, which I have much pleasure in submitting herewith, will be read, it is believed, with gratification.

The material progress made in the operation of this Railway is modestly set forth by the Genaeral Manager in his report. The tabulated statement given in it shows, at a glance, the steady yearly increase in the amount of Net Earnings since the Open Line working began in 1908; while the indirect benefits and improvements, which the country served by the Line has begun to enjoy are also briefly noticed.

The working of the Line and the results obtained during the period under review are discussed in greater detail in the several reports by the Chief Accountant and the other Heads of Departments, which will be found to contain much matter of technical and general interest.

The capacity of the Line has been taxed to its extreme limit, it would seem, during the whole year with a slight slackening only during the hot season. Due acknowledgment should, therefore, be made, as remarked by the General Manager in his concluding paragraph of the very good work performed by all the officers and employees of the Line, Chinese and Foreign, including the General Manager himself, under somewhat trying conditions, owing to the necessity of handling the enormously increased passenger and goods traffic, including the movement of large bodies of troops and paraphernalia from time to time, without a corresponding increase of rolling-stock and adequate equipment to meet the ever growing demands upon the Line.

The result of the year's work, therefore, must be considered gratifying; and as there is good prospect of securing additional rolling-stock in the not distant future, the General Manager's hope as to the Line earning its guaranteed interest may be realized by the end of the current year.

REPORT BY THE GENERAL MANAGER

The report of the General Manager, Mr. A. W. U. Pope, C.I.E., is as follows:—The Annual Accounts for the Calendar year 1912, are herewith submitted. Comment is frequently made regarding the loss to the Chinese Government in having to make up annually a certain amount representing the difference between the Interest due on the Capital Loan for the construction of this line and the amount of money paid towards it by the Net earnings, due to the working of the line; in other words the annual deficit. The figures given below show the annually diminishing deficit to be made up since the opening of the Railway for traffic, and they should convince those who peruse them impartially that the progress made by the Railway towards the full payment of its, so to speak, guaranteed interest has been consistent, very considerable, and quite in proportion to the results achieved by similar undertakings in the East, in fact anywhere.

Year.	Total of interest charges to be made up. (This varies on account of Exchange.)	Net Earnings made by Railway.	Annual Loss to Chinese Government.
1908	$ 1,692,333	$517,815	$1,174,518
1909	1,662,635	581,567	1,081,068
1910	1,564,850	627,671	937,179
1911	1,548,056	760,886	787,170
1912	1,386,909	A971,149	B 415,760

(A) This would have been $200,000 better if the Rolling Stock asked for eighteen months ago had been supplied.

(B) This would have been $200,000 less for the same reason.

A certain Power which has built 30,000 miles of Railway in the East most successfully; and is making a very handsome profit from them. lays it down as a fixed policy that Capital spent in constructing a Railway is well spent, and a sound investment if it earns its guaranteed interest, on the money borrowed, by the fifth year after the Railway has been open to public traffic. This Railway has been open fours years; and is in easy sight of such a state of affairs; nay would now be actually paying 5% if it had the Engines and rolling stock it has asked for some time back, and if it was not so very hard hit by exchange.

Similarly a just appreciation of the unique difficulties of Likin, shortness of rolling stock, discriminative competition by river and creek will, I feel sure, convince those accustomed to judge Railway results that the Administration has not neglected its opportunities.

A great deal of course depends on the standard of business aimed at, and it would be well to bear in mind that in accordance with the explicit terms of its Loan agreement this Railway has been worked, as far as it can be, according to the best modern practice. Thus the Shanghai-Nanking Railway is unique in China (I speak under correction) in assuming the position of Legal Bailee for the time being, with reference to its traffic both Coaching and Goods and the property entrusted to its charge for carriage; as all Railways in other countries are obliged to do by law; and in taking upon itself all the responsibilities entailed by the Board of Trade regulations for safety and care as far as they can be made applicable to the circumstances of the country. This fact alone will make it clear to all experienced readers that such responsibilities mean a very gradual evolution towards paying conditions in a new country; and that, when reached, the finance of the Railway will be on a sound and abiding foundation.

In harmony with the above remarks it has been the settled policy of this Railway, a policy warmly supported by the Managing Director, to place the development of the country, the nursing of the commercial welfare of the big towns, in other words the indirect profits and advantages to the country first and foremost; realizing that frequent means of communication beween places of business, ready and safe means for the transport of merchandise and money, the fostering of all facilities for "business" makes "business" on the principle that "often the sight of means to do ill deeds make ill deeds done" and also good ones. Such openings up of business increase the power of taxation, increase the value of land and generally build up cities. In support of the indication that our efforts in this gradual development of the business possibilities in fact our building up the indirect profits (which must act forcibly on the direct profit bearing possibilities of the Railway, as Night follows Day) are meeting with considerable success, I quote the following written statements from Chambers of Commerce, gentry, merchants of Soochow, and Wusih.

"Improvements in local and business conditions at Soochow since the opening of the Shanghai-Nanking Railway to traffic.

1.—Since the establishment of the railway station at Soochow the vast tract of waste land in the vicinity of Chong Men and Chi Men has greatly risen in value and modern buildings have been erected thereon along the approach road to the Chong Men street. All sorts of shops, stores and other houses have been opened and the place has rapidly become a flourishing and prosperous market and is still developing.

2.—Since the construction of the modern macadamized road approaching the station great facilities have been offered to the travelling public and a large class of people has been able to find a means of living by pulling ricshas, driving carriages, keeping stalls, etc., a circumstance which has had an indirect bearing on the maintaining peace and good order.

3.—Owing to the rapidity of transportation by rail the products of native industry such as sea products, silks, embroidery, etc., can be rapidly transported from the interior for sale and thus the business has been increased five or six fold in comparison with days of steam-launch locomotion.

4.—People are greatly benefited by the rail-borne post so that a return post may be expected in a day's time in communicating with Nanking, Chinkiang and other places along the Line.

5.—Consequent upon the building of the railway has come the establishment of telephones and electrical lighting, thereby greatly improving the conditions of life by affording safety in the streets at night and rapid communication, such as we have never enjoyed before.

6.—The splendidly comfortable coaches of your railway, the good treatment and civility to the passengers as well as other perfections leave nothing to be desired. These are entirely due to the efforts of the Shanghai-Nanking Railway which has rendered great services to China, for which we feel greatly indebted. There is only one thing we have to point out that since the opening of the T. P. R. the goods traffic on the Shanghai-Nanking Railway has been steadily increasing but owing to the shortage of wagons of the latter the traffic resulting occasionally congregated or blocked thereby in inevitable thefts. Hoping the General Manager of the Railway is aware of existing imperfection and will see his way to enquire into the matter and to purchase the additional wagons so that the merchants will feel greatly encouraged by giving their transportation to the railway entirely.

The products and business condition in Wusih.

1.—COCOONS AND SILKS. Before the establishment of railways the transportation of them by ships from Wusih to Shanghai takes 4, 5 or 6 days, now it takes only 12 hours, including the time for loading and unloading.

2.—RICE AND BARLEY. As above.

3—SUNDRIES. As above.

4.—WOOD AND IRON MATERIALS. The transportation of them by ships from Shanghai to Wusih takes 5 or 6 days; but that by rail for the same distance takes only 6 hours.

5.—COAL AND PETROLEUM. As above.

6.—THE PASSENGERS. The launches may take them to Shanghai in 24 hours and the native junks may do so in 4 or 5 days. The rail can take them to Shanghai in 3 hours only.

7.—THE BUSINESS CONDITION. Before the establishment of railways, the income and outcome amounts not so much as 10,000,000. Now they have 20,000,000.

8.—COST OF LAND. Before the establishment of railways, each mow cost $20 or $30. Now each mow along the maloo costs $2,000.

9.—STYLE OF HOUSES. Before the establishment of the railways, the houses are in Chinese style. Now they are over 20 factories and godowns.

10.—THE ELECTRIC LIGHTS AND TELEPHONE. Two companies are started after the establishment of the railways.

11.—THE HOTELS. Before the establishment of railways, not a single one is built. Now there are over 20 places."

These letters and remarks, spontaneous as they are, coming from the actual people concerned, are a complete justification for the contention that the Shanghai-Nanking Railway

being a commercial enterprize, undertaken for the express purpose of serving the civil and military needs of the country may take to itself an amount of credit for indirect profits, more than sufficient to make up the balance between what it has actually directly paid and the 5% interest on the borrowed capital: and further that the actual payment of its direct 5% profit on its capital is a foregone sequence on these facts.

I hope I have made it clear that this Railway is doing its duty as far as the civil needs of the country are concerned and I think the events of the past year connected with the revolution have shown by the acknowledgment of the authorities, often and unstintingly expressed, verbally and in writing, that it fully did its duty in the time of strife and war in carrying the troops efficiently and in allowing the entire free movement of the people in safety when they were anxious to escape from the actual scenes of fighting. Competent Chinese authority has placed great value on this last fact as being one of the principal causes of the ungrudging sympathy and acquiescence in the local events of the revolution by the population at large.

I will close this Report with a very hearty acknowledgment of the work done by the officers and staff during the past year 1912. Extraordinary night and day work suddenly fell upon a staff not sufficiently recruited for day work, owing to the introduction of an oft resisted measure of reduction, and only those who experienced it can realize what stress of work the Officers and men, Chinese and Foreign, went through in the way of long hours, heavy work, attended often with considerable risk, and I commend them one and all to the special attention of the Managing Director, the Corporation and the Chinese Government.

REPORT BY THE CHIEF ACCOUNTANT

Mr. H. Middleton, Chief Accountant, reports as follows:—

Coaching Earnings.—As was anticipated the budget estimate has been largely exceeded. Coming to a detailed analysis of the results for the year, the following points are of interest. The details given below state approximately the proportions between the 1st and 2nd (combined), 3rd and Coolie classes:—

Class	Earnings Amount	Earnings Percentage	Passengers carried No.	Passengers carried Percentage	Vehicles in use No.	Vehicles in use Percentage
1st and 2nd	$ 318,516	14	220,038	5	21	24
3rd	1,639,113	75	4,091,836	83	49	57
Coolie	240,497	11	569,602	12	16	19
Total..	$2,198,126	100	4,881,476	100	86	100

The following table gives the number of passengers carried on the Main Line during the past three years:—

	1st	2nd	3rd	Coolie.
1910	16,622	134,913	2,977,813	472,233
1911	13,770	115,422	3,053,107	508,510
1912	17,563	114,749	3,076,903	569,602

There is a large increase in the numbers carried under 1st and a small decrease under 2nd class as compared with the previous year. For 1st class the amount earned also shews a large increase. Of the total increase of $32,000 no less than $29,000 came from the traffic between Shanghai and Nanking. For 2nd class against a total increase of $22,000 there is an increase of $38,000 between Shanghai and Nanking alone as compared with the previous year, decreases in the short distance traffic being responsible for the difference. For 1st class generally speaking, the short distance traffic shews a shrinkage as compared with the previous year. This tendency is even more marked for 2nd class. Third class traffic shews an increase of $192,000 in round figures, a result which is very satisfactory indeed. Coolie class continues to show a marked development, the increase being $48,000.

The Woosung line continues to shew the marked development of the past two years. The following table compares the results for five years prior to the introduction of the reduced fares on the 1st January, 1910, and the three succeeding years:—

	At old fares 1905	At old fares 1907	At old fares 1909	At reduced fares 1910	At reduced fares 1911	At reduced fares 1912
Total number of passengers	544,296	486,081	412,259	886,472	981,510	1,102,658
Amount earned	$113,510	98,342	88,598	77,611	87,302	99,906

The following table shews the results for carriage of Specie during the past three years:—

		1910	1911	1912
Total value of coins carried		$53,210,419	73,176,870	107,878,079
Weight " "	Piculs	26,113	37,202	57,680
Amount earned for freight		$ 12,600	13,200	12,000

The receipts under the head "Passengers' luggage" shew a fall.

Parcels traffic shews an increase of nearly 140%, and heads V and IX also shew considerable development.

Goods Earnings.—The actuals have more than exceeded the estimate.

The "Up" traffic (*i.e.* from Shanghai to Nanking) produced under 30% of the total.

Sundries.—The actuals proved to be $11,000 less than the budget estimate for reasons beyond our control.

Working Expenses.—Although the aggregate amount considerably exceeds the provision made in the budget estimate, the percentage works out at exactly the same figure, viz:—64.70%. The percentage for the year shews an improvement of 2½% over that of the previous year. The percentage for the 1st half of the year works out to 59.29% and for the 2nd half to 68.60% or an increase of 9%.

It will be noticed that in most of the Abstracts the charges for salaries are less than in 1911. This is mainly due to the bonuses granted to the staff in that year for services rendered in connection with the Revolution.

Abstract A.—Shews an excess of about $31,700 over the budget, though the percentage is 0.27 lower. The saving of $6,400 under head II is largely due to a considerable quantity of permanent-way material having been returned to Stores. The saving of $4,000 under head III is due to certain work having been deferred in order to make funds available under head IV which shews an excess of nearly $23,500. Of this sum $4,000 is covered by the saving under head III, the remainder being due to a number of small works, such as the repairs to the jetty, platforms, footbridge and Station Master's house at Chinkiang, $5,000, the matshed with electric lighting at Markham Road, $3,500, alterations to the Wusih godowns $5,000, and four or five other small works, costing not more than $1,500 each. Under head VI the excess of $20,800 is due to the bridge it was found necessary to build at mile 146¼ and to the electric train staff installation between Shanghai and Soochow. The cost per mile maintained shews an increase of $47.

Abstract B.—Shews an excess of $52,000 round over the budget, but the percentage is 0.54 lower than was anticipated. The excess is due to the increased cost of heads III and V caused by the increased train service.

Abstract C.—Shews an excess of $20,500 round over the budget estimate. This is principally due to the excess of $3,000 under head III caused by the increased train service and to the excess of $15,000 under head IV caused by the alterations to rolling-stock mentioned in the Locomotive Superintendent's report. The cost per train mile has increased by nearly one per cent.

Abstract D.—Shews an excess of $88,000 over the budget which is made up by excesses of $8,700 under head II, $2,900 under head III, $22,500 under head IV, $1,900 under head V and $2,500 under head VI. There is a saving of $4,000 under head VII. The excess under head IV is larger than the original budget provision. The percentage, viz: 13.83 is 1.57% higher than was anticipated.

The cost per train mile has increased by 1.38 cents.

Abstract E.—Shews an excess over the budget estimate of $5,400. Owing to the increased earnings the percentage is all but 2% lower than what was anticipated

Abstract F.—Calls for no comment.

Abstract G.—Shews an excess over the budget estimate of $42,600. This is principally due to the heavy loss under the head "Discount" which amounts to $30,400 more than in the previous year. The rates at which small money could be disposed of proved to be the highest we have yet experienced, averaging 14.54% for the year, *i.e.* more than 1½% higher than in the previous year. As we recover 10% from the public, our loss amounted to 4.54% against 2.92% in 1911. Bad debts written-off account for $5,100. The increase in the amount of Commission paid was $5,000, and the loss on Exchange due to the rapid rise throughout the year was $2,100.

Cash Balances.—Of the sum of $52,251 outstanding at the close of 1911 for uncashed bank notes, $10,520 were realized during the year, leaving the balance of $41,731 at the close of the year. Of this balance $450 have since been realized to date.

Net Earnings.—These proved to be $101,500 higher than was anticipated and represent a return of 3.50% on the nominal value of the loan bonds. The improvement is more than 1% as compared with the previous year, and is partly due to the increased net earnings and partly to the high rates of exchange which prevailed at the dates on which the interest charges were paid.

Statistics.—Those for passenger traffic shew a marked improvement under items 2, 3 and 5 of the analysis given elsewhere though item 7 shews a considerable fall.

CAPITAL AUTHORISED AND RAISED BY DEBENTURE STOCK

Under Loan Agreement.	Nominal value of bonds.	Rate of issue	Amount of discount	Actual amount realised.	Actual sum realised in local currency.	Remarks.
	£		£	£	Tls. c.	
First issue	2,250,000	90%	225,000	2,025,000	14,482,665 81	Interest is payable at the rate of 5% per annum on the nominal value of the bonds.
Second „	650,000	95½%	29,250	620,750	4,276,798 65	
Total	2,900,000		254,250	2,645,750	18,759,464 46	

CAPITAL BALANCE SHEET AT END OF DECEMBER, 1912

Heads of Accounts.		Debit. Taels. Cts.	Credit. Taels. Cts.
Capital I.	£2,025,000		14,482,665 81
Capital II	£ 620,750		4,276,798 65
London Account	£ 966.13.6	6,712 54	
Hongkong and Shanghai Bank		3,095 53	
Interest on Loan		1,819,159 61	
Commission on Purchases in England	£34,352.3.8	243,582 81	
Commission on Purchases in China		202,496 88	
Commission—General		8,299 45	
Transfers, Revenue			32,411 07
Nanyang College		10,000 00	
Exchange		68,451 34	
Likin Confiscation		3,825 64	
Final Heads as per Schedule A.		17,626,681 91	
Suspense Accounts		285,142 09	
Capital Outlay, Woosung Section		1,026,441 86	
Land Exchange		9,247 34	
Chinese Government Advances			2,521,261 47
Total Shanghai Taels		21,313,137 00	21,313,137 00

SCHEDULE A, CAPITAL FINAL HEADS

Heads of Account.		Expenditure during the year. Tls. Cts.	Expenditure from the commencement of operations. Tls. Cts.
I.—Preliminary Expenses		7 00	16,696 63
II.—Land, Main Line	£250,000		1,835,065 43
II.—Land, Miscellaneous			1,998 31
III.—Formation		1,258 00	1,714,866 43
IV.—Bridgework		1,785 64	1,966,356 91
V.—Fencing			48,963 03
VI.—Electric Telegraph		2,075 01	69,282 57
VII.—Track		8,688 24	4,842,218 19
VIII.—Stations and Buildings		33,850 85	2,292,925 09
IX. Plant		1,761 51	422,143 60
IX. Rolling Stock		3,855 85	2,636,041 55
X.—General Charges		44 75	1,780,124 17
Total Shanghai Taels		24,715 65	17,626,681 91

Revenue Balance Sheet at end of December, 1912

Heads of Account.	Debits. Dollars. Cts.	Credits. Dollars. Cts.
Hongkong and Shanghai Bank	* 98,659 57	
Imprests	1,340 89	
Transfers, Capital	44,398 69	
Suspense Heads	97,161 72	
Chinese Government Advances		(a) 241,560 87
Grand Total Mexican Dollars	241,560 87	241,560 87

* This amount includes $41,731 retained in the Railway cash safe on account of Nanking and Soochow Government bank notes unrealizable at end of December 1912. Another $450 have been realized to date.

(a) These are net figures after adjusting the difference between the "Interest on Loan" and "Net Earnings" as a charge to this head.

REVENUE ACCOUNT for the year ending 31st December, 1912.

DR. EXPENDITURE.

Year ending December, 1911.	Per cent on gross receipts.		Abstract	Year ending December, 1912.	Per cent on gross receipts.
257,321 30	11.43	To Maintenance of Way Works and Stations	A	268,671 81	10.04
399,641 69	17.75	„ Locomotive Expenses	B	459,895 26	17.19
106,655 52	4.74	„ Carriage and Wagon Expenses	C	135,783 65	5.07
298,539 46	13.26	„ Traffic Expenses	D	370,080 19	13.83
361,476 91	16.06	„ General Charges	E	358,414 42	13.39
422 70	.02	„ Flotilla Expenses	F	372 00	.01
66,128 97	2.94	„ Special Expenses	G	111,577 06	4.17
1,490,186 55	66.20	Total		1,704,794 39	63.70
760,885 62	33.80	„ Balance, Net Earnings		971,148 52	36.30
2,251,072 17	100.00	Total Dollars		2,675,942 91	100.00

CR. EARNINGS.

Year ending December, 1911.	Per cent on gross receipts.		Abstract	Year ending December, 1912.	Per cent on gross receipts.
1,944,133 63	86.37	By Coaching Traffic	H	2,249,045 13	84.05
1,283 83	.06	„ Telegraph Earnings	:	1,214 66	.04
239,162 61	10.62	„ Goods Traffic	I	387,758 85	14.49
Nil		„ Flotilla Traffic	J	Nil	
66,492 10	2.95	„ Sundries	K	37,924 27	1.42
2,251,072 17	100.00	Total Dollars		2,675,942 91	100.00

ABSTRACT A.

Previous year.	Maintenance of Way, Works & Stations	Current year.
$ c.		$ c.
	I.—General Superintendence:—	
31,343.97	Engineer's salaries.	27,459.03
6,545.88	Allowances of ditto., including travelling.	5,412.71
21,760.70	Salaries of Subordinate Superintendents.	20,168.45
855.33	Allowances of ditto., including travelling.	789.48
12,293.11	Salaries and allowances of Office Staff. .	11,425.58
3,155.81	Office expenses.	3,457.54
75,954.80		68,712.79
	II.—Maintenanee and renewal of Track:—	
98,442.97	Wages	89,332.46
23,184.46	Materials	5,800.33
121,627.43		95.132.79
	III.—Maintenance of Bridges, etc:—	
4,664.52	Bridges and tunnels	5,578.61
8,563.61	Earthwork, fencing, roads, etc. . . .	1,803.53
13,228.13		7,382.14
	IV.—Maintenance of Buildings and Fixtures:—	
32,123.44	Buildings and fixtures, excluding staff quarters	55,938.75
2,059.50	Staff quarters	2,522.13
——	Joint stations	——
34,182.94		58,460.88
	V.—Maintenance of Tools and Plant:—	
3,039.70	Tools and plant.	3,868.01
313.61	Furniture and instruments	38.92
556.56	Electrical plant.	722.53
3,909.87		4,629.46
6,329.11	VI.—New Minor Works:—	31,606.61
	VII.—Miscellaneous:—	
756.58	Plantations	216.00
131.69	Loss on stores	161.46
4,443.85	Carriage of stores	2,692.60
——	Loss or gain by exchange.	——
5.332.12		2,747.14
260,564.40		268,671.81
3,243.10	Supervision charges debited to Capital A/c.	——
257,321.30	Total...	268,671.81

Mean mileage maintained by Revenue.	Miles.
Double line.	Nil.
Single line	212.30
Sidings	31.18
Total single track, including sidings	243.48

	1910	1911	1912
Cost per mile—	901.77	1,050.72	1,103.47

N.B.—The embankment and bridges are for a double line as far as mile 53.1564' (Soochow), though only a single line of rails has been laid and maintained.

ABSTRACT B.

Previous year.	Locomotive Expenses.	Current year.
$ c.		$ c.
	I.—General Superintendence:—	
7,308.56	Salaries of Superintendents.	6,799.97
1,270.60	Allowances of ditto., including travelling	2,230.50
17,400.34	Salaries of Subordinate Superintendents.	15,527.28
556.05	Allowances of ditto., including travelling	583 74
11,252.02	Salaries and allowances of Office Staff .	11,055.06
2,165.01	Office expenses	1,988.03
39,952.58		38,184.58
	II.—Running Expenses:—	
20,730 51	Wages of drivers and firemen	19,797.94
76.60	Allowances of ditto.	7.00
8,621.39	Labour charges on running engines . .	8,332.81
44.51	Clothing	88.50
1,297.23	Contingent expenses	1.142.02
30.770.24		29.368.27

1911.			1912.	
	Tons. Cwt.	III.—Fuel:—	*Tons. Cwt.*	
222,816.98	25,358. 8	Coal	31.214. 9	268,696.42
572.47		Bamboos, baskets, etc.. .		409.30
——		Wood.		——
2,818.29		Wages		2,755.06
226,207.74				271,860.78

12,093.63	IV.—Water:—	13.405.12
19,598.33	V.—Running Stores:—	27,158.72
	VI.—Maintenance of Locomotive Engines:—	
26,323.00	Wages.	28,517.47
34,535.49	Materials	37,752.97
60.858.49		66.270.44
	VII.—Maintenance of Plant and Machinery:—	
63.60	Wages	806.52
754.13	Materials	2,103.71
149.51	Furniture and Fittings	100.90
967.24		3,011.13
602.80	VIII.—New Minor Works:—	1,089.91
	IX.—Miscellaneous:—	
2,828.56	Loss on stores.	1,171.23
5,732.69	Carriage of stores	8,350.15
29.39	Exchange	24.93
8,590.64		9,546.31
399,641.69	Total...	459,895.26

	1910	1911	1912
Cost per Engine mile in cents. . . .	33.93	35.28	35.31
Coal consumption per Train mile (weight in lbs.)	65.06	62.71	64.88
Coal consumption per Engine mile (weight in lbs.)	53.81	50.15	53.68
Coal consumption per Train mile (cost in cents)	25.78	24 60	24.93
Coal consumption per Engine mile (cost in cents)	21 32	19.67	20.63

ABSTRACT C.

Previous year.	Carriage and Wagon Expenses.	Current year.
$ c.		$ c.
	I.—General Superintendence:—	
7,781.49	Salaries of Superintendents	8.314.23
1,625.93	Allowances of ditto., including travelling	2,376 21
9,385.08	Salaries of Subordinate Superintendents	8,551.93
278.01	Allowances of ditto.. including travelling	311.51
7,077.43	Salaries and allowances of Office Staff .	6,933.69
975.73	Office expenses	1,030.68
27,123.67		27,518.25

		II.—Maintenance of Vehicles:—		
		Coaching		
	14,300.14	(*a*) Wages . .	16,107.86	
34,028.54	19,728.40	(*b*) Materials .	25,253.45	41,361.31

Previous year				Current year
		Goods.		
	5,478.06	(a) Wages . .	5,104.22	
15,846.93	10,368.87	(b) Materials .	13,417.75	18,521.97
49,875.47				59,883.28
		III.—Running Expenses:—		
8,617.16		Labour		8,150.35
17,343.73		Materials.		21,103.31
51.99		Clothing		86.00
26,012.88				29,339.66
2,277.87		IV.—Minor Works:—		15,995.25
		V.—Maintenance of Plant and Machinery:—		
17.40		Wages.		398.31
178.00		Materials		918.23
24.76		Furniture and fittings		51.36
220.16				1,367.90
		VI.—Miscellaneous:—		
1,048.77		Loss on stores		1,559.35
82.01		Carriage of stores		107.48
14.69		Exchange		12.48
1,145.47				1,679.31
106,655.52			Total...	135,783.65

	1910	1911	1912
Cost per Train mile in cents . . .	12.39	11.77	12.60

Abstract D.

Previous year. $ c.	Traffic Expenses.	Current year. $ c
	I.—General Superintendence:—	
28,636.25	Salaries of Superintendents	23,333.23
8,637.93	Allowances of ditto., including travelling	4,267.76
12,469.83	Salaries of Subordinate Superintendents	16,607.08
1,020.82	Allowances of ditto, including travelling	1,303.38
19,820.44	Salaries and allowances of Office Staff .	19,792.51
6,503.33	Office expenses	7,268.19
77,088.60		72,572.65
	II.—Station Staff:—	
134,099.24	Salaries	130,969.14
996.42	Allowances	1,475.63
30.92	Office expenses	7.95
135,126.58		132,452.72
	III.—Train Staff:—	
18,269.05	Salaries	21,449.73
223.11	Allowances	151.08
145.00	Running room expenses.	285.00
18,637.16		21,885.81
	IV.—Traffic Stores:—	
19,982.72	Station and office stores.	25,281.29
575.28	Vehicle equipment	9,886.73
2,107.42	Fittings and furniture	7,808.98
22,665.42		42,977.00
8,155.50	V.—Clothing:—	7,936.33
14,351.24	VI.—Printing, Stationery and Tickets:—	16,042.47
19,512.50	VII.—Handling Charges:—	20,901.11
—	VIII.—Goods Agency Commission:—	53,387.55
	IX.—Miscellaneous:—	
1,000.50	Clocks, etc.	1,496.87
1,871.77	Loss on stores	260.10

Previous year	Item	Current year
6.80	Carriage of stores	92.30
123.39	Exchange	75.28
3,002.46		1,924.55
298,539.46	Total...	370,080.19

	1910	1911	1912
Cost per Train mile in cents	29.76	32.96	34.34

Abstract E.

Previous year. $ c.		General Charges.		Current year. $ c.
		I.—London Charges:—		
4,739.49		Consulting Engineers' fees		4,640.67
400.00		Auditors' fees		400.00
862.56		Office expenses		442.69
6,002.05				5,483.36
		II.—Charges in China:—		
37,836.62		Foreign Commissioners and General Manager		36,692.64
134,916.49		Chinese Department		127,698.41
59,255.85		Audit and Accounts		56,029.40
10,252.19		Stores		6,024.63
17,530.52		Medical		15,541.55
3,361.82		Rents		3,340.90
		Furniture and Instruments		
	33.00	(a) Chinese Department	552.70	
	402.45	(b) Other Departments .	1,570.71	
	435.45		2,123.21	
		Office Expenses		
	3,096.52	(a) Chinese Department	5,877.50	
	6,737.41	(b) Other Departments .	8,052.84	
	9,833.93		13,930.34	
	1,591.08	(a) Medicines . . .	1,250.90	
	11,058.29	(b) Hospital charges .	13,510.95	
	12,649.37		14,761.85	
1,106.59		Schools		1,336.13
38,340.12		Police		40,682.72
2,606.97		Advertisements		6,512.01
		Telegraph		
	5,824.24	(a) Salaries and allowances	5,746.01	
21,367.85	15,543.61	(b) Maintenance. . . .	17,501.28	23,247.29
349,493.77				347,921.08
		III.—Miscellaneous:—		
5,119.12		Fire appliances and insurance premia .		4,638.85
667.28		Loss on stores		104.74
12.65		Carriage of stores		6.25
620.72		Exchange		260.14
6419.77				5,009.98
361,915.59		Less:—		358,414.42
438.68		Supervision charges debited to Capital A/c.		—
361,476.91		Total...		358,414.42

Abstract F.

Previous year. $ c.	Flotilla Expenses	Current year. $ c.
	I.—Working Vessels:—	
418.50	Salaries and allowances	372.00
4.20	Handling charges	
	Victualling	
422.70	Total...	372.00

ABSTRACT G.

Special Expenses.

Previous year. $	c.	$	c.		Current year. $	c.	$	c.
				I.—Compensation:—				
		3,102	19	For goods lost or damaged	705	81		
		64	93	For personal injury . . .	47	20		
		759	73	For other claims	2,373	05		
3,926	86						3,126	06
185	88			II.—Losses of cash and bad debts written off.			5,281	79
				III.—Payments to other lines:—				
		—	—	Locomotive borrowed . .	—	—		
		279	00	Vehicles borrowed. . . .	1,282	24		
279	00						1,282	24
18,047	62			IV.—Commission.			23,146	15
43,328	89			V.—Discount on subsidiary coins.			73,748	84
—	—			VI.—Provident Institution.			—	—
				VII.—Miscellaneous:—				
		68	04	Law charges	133	65		
		262	13	Rates and taxes	125	36		
				Gardens	996	00		
				Loss on light and base coins	20	00		
		15	56	Exchange	2,116	11		
		15	00	Miscellaneous	1,600	86		
360	73						4,991	98
66,128	97			Total			111,577	0

ABSTRACT H.

Coaching Traffic.

Previous year.		Single fare per mile	First Class about 4 cents		Second Class about 2 cents		Third Class 3rd about 1 cent Coolie about ¾ „		TOTAL	
$	c.	I—Passengers	No.	Amount	No.	Amount	No.	Amount	No.	Amount
1,636,565	91	Ordinary	44,260	74,047.67	147,202	193,233 47	4,013,289	1,582,577.32	4,204,751	1,849,858.46
192,428	18	Coolie Class	—	—	—	—	569,602	240,496.86	569,602	240,496.86
22,152	70	Government	1,677	6,263.60	5,995	9,663.65	59,416	32,685.13	67,088	48,612.38
2,116	45	Privilege	28	49.30	452	447.02	13,763	1,846.73	14,243	2,343.05
35,686	93	Excursion	4,799	12,958.65	15,625	18,308.20	5,368	1,014.89	25,792	32,281.74
14,723	27	Excess fares		982.04		2,562.74		20,988.71		24,533.49
1,903,673	44	Total	50,764	94,301.26	169,274	224,215.08	4,661,438	1,879,609.64	4,881,476	2,198,125.98
		Previous year . . .	42,378	61,844.99	164,249	202,529.98	4,465,077	1,639,298.47	4,671,704	
		Season tickets . . .	7	165.00	17	85.00	674	1,531.30	698	1,781.30
1,670	85	Previous year . . .	2	18.00	16	139.00	613	1,513.85	631	
1,905,344	29									2,199,907.28

Previous year $	c.			No.	Amount
21,292	23	II.—Passengers' Luggage and Specie	Piculs	66,924	17,542.42
		III.—Government Baggage	„	68	20.00
		IV.—Parcels:—			
6,572	08	(*a*) For the Public	„	52,373	15,701.62
—	—	(*b*) For Revenue	„		— —
2,204	36	V.—Horses, Carriages, Dogs, etc. (Ordinary)	No.	3,201	3,779.92
230	00	VI.—Horses, Carriages, Dogs, etc. (Government)	„	334	391.55
3,802	33	VII.—Special Trains	Train-miles	4,650	7,157.00
5	20	VIII.—Trollies	Trolley-miles	56	32.00
2,683	14	IX.—Miscellaneous			3,513.34
(*a*) 2,000	00	X.—Post Office			1,000.00
1,944,133	63	Total			2,249,045.13

N.B.—The Excess fares have been divided up between I, II and III class in the same proportion as the actual "Ordinary" traffic for these classes.

(*a*) The usual annual fee from the Post Office for 1910 was realised after the accounts for that year had been closed.

ABSTRACT I.

Goods Traffic.

Previous year. $ cts.		No. of piculs lifted.	Amount $ cts.
212,522.16	I.—General merchandise	7,194,559	*342,918.94
106.90	II.—Government stores	114,319	6,372.20
1,781.35	III.—Railway material for construction	35,743	386.35
214,410.41		7,344,621	349,677.49
	IV.—Coal		
1,354.45	(*a*) For the public	89,079	3,348.65
5,610.40	(*b*) For Loco. Dept. (Revenue only)	566,425	8,164.25

7.15	(*c*) For other Railway services	2,394	7.45
6,972.00		657,898	11,520.35
	V.—Revenue stores, for all Depts.		
4,476.05	excepting coal	203,334	3,307.00
225,858.46		8,205,853	364,504.84
	VI.—Livestock (Ordinary)	No.	
11,581.05	(*a*) Horses, cattle, etc. . . .	22,922	17,582.50
3,910.80	(*b*) Sheep, goats, pigs, etc. . .	8,718	2,716.95
15,491.85		31,640	* 20,299.45
	VII.—Livestock (Government) . . .		
	(*a*) Horses, cattle, etc. . . .	795	677.50
	(*b*) Sheep, goats, pigs, etc. . .		
— —		795	677.50
	VIII.—Rents, demurrage, wharfage, storage, etc.		2,242.61
2,190.35			
2 65	IX.—Miscellaneous		34.45
239,162.61	Total		387,758.85

N.B.—16-75 piculs are taken as the equivalent of a ton.
*The above are net figures after deducting rebates.

		1910	1911	1912
Rebates allowed	$	11,766	12,707	26,278

ABSTRACT K.

Sundries.

Previous year.			Current year.
$ cts.			$ cts.
200.75	Hire of locomotives		1,733.45
943.00	Hire of wagons		906.00
	Mileage and Demurrage on vehicles over		
2,376.70	other lines.		210.00
168.75	Advertising		259.90
3,961.19	Rents of houses and lands		6,661.40
10,180.45	Rents of refreshment rooms and cars .		11,526.50
	Profits from Locomotive and Engineering		
30,615.00	Workshops		* 5,285.40
169.45	Sale of unclaimed and damaged goods .		247.25
216.81	Unclaimed or unpaid salaries		215.89
3,670.15	Carriage and rickshaw permits and fines		4,003.30
4,032.46	Interest		4,724.25
	Sale of Revenue stores		
	496.80 Engineering	149.61	
	2,017.14 Locomotive	2,719.54	
	22.31 Traffic.	33.39	
2,781.82	245.57 General	— —	2,902.54
1,412.74	Miscellaneous		2,310.20
5,762.83	Exchange		7,508.99
66,492.10	Total		37,924.27

* Due to loss on the contract for the Tientsin-Pukow Railway coaches

Statement of Train Mileage

Previous year. Miles.	Previous year. Estimated Locomotive expenses. $			Current year. Miles.	Current year. Estimated Locomotive expenses. $
543,661	191,830	Train miles run for public traffic. . .	Passenger	446,858	157,785
65,262	23,028		Goods .	176,530	62,332
284,908	100,529		Mixed .	410,137	155,412
12,009	4,237		Light . .	14,170	5,003
		Train miles run for Locomotive Department			
		Train miles run for Maintenance			
905,840	319,624	Total train Mileage . . .		1,077,695	380,532
7,840	2,766	Miles of assisting engines (actual distance)		3,476	1,227
216,634	76,439	Miles of engines shunting and standing in steam for traffic purposes, calculated at 5 miles an hour		219,942	77,661
2,305	813	Miles run for Miscellaneous services (actual distance) .		1,344	475
226,779	80,018	Total Miscellaneous engine mileage		224,762	79,363
1,132,619	399,642	Total engine mileage		1,302,457	459,895

DISTRIBUTION OF PASSENGER AND GOODS MILEAGE

Passenger.	Miles.	Goods.	Miles.
Passenger train mileage . .	446,858	Goods train mileage . . .	176,530
Light (passenger) . . .	—	Light (Goods)	—
Proportion of Mixed mileage	355,086	Proportion of Mixed mileage	85,051
Do. Light mixed .	10,157	Do. Light mixed .	4,013
		Maintenance (Earnings from this source credited to Abstract K.)	—
Total . .	812,101	Total . . .	265,594

NET REVENUE ACCOUNT for the year ending 31st December, 1912.

	DR $ c.
To interest paid in London during the half-year ending June, 1912, £72 500, @ 2/9 3/16 and 75.1.	698,127.55
To interest paid in London during the half-year ending December, 1912, £72,500, @ 2/10 and 74 3.	688,781.56
Total	1,386,909.11
	CR
By net earnings of the year as per Revenue Account.. . .	971,148.52
By balance—being net loss.	415,760.59
Total	1,386,909.11

ACCOUNT OF TOTAL NET RECEIPTS

	DR.
To net earnings for the half-year ended June. 1912. . . .	572,860.92
" " " December, 1912. .	398,287.60
To increase of balance at credit of Demands Payable. . .	12,148.12
" " debit London A/c.	1,208.42
To Government banknotes realized during the year . . .	10,520.00
Total	995,025.06
	CR.
By increase of balance at debit of Traffic Account. . . .	2,810 24
" " " Miscellaneous Advances .	42,087.20
By reduction in balance at credit of Foreign Railways . .	1 906.14
By amount of net receipts.	948,221.48
Total	995,025.06

INTEREST ACCOUNT

	DR.
To amount of net receipts as per account above	948,221.48
To balance—being excess of interest over net receipts . .	438,687.63
Total	1,386,909.11
	CR.
By interest paid in London for 1912 as per net Revenue Account above.	1,386,909.11
Total	1,386,909.11

ANALYSIS OF THE WORKING RESULTS

For the year ending 31st December, 1912.

AVERAGE LENGTH OPEN 203.25 MILES

PASSENGER		1910.	1911.	1912.
Receipts from coaching traffic	$	1,766,338	1,944,134	2,249,045
Receipts per mile open	"	8,690	9,565	11,065
" " per week .	"	167	183	212
Passenger train-miles run . .	No.	742,479	735,991	812,101
Average receipts per passenger train-mile	$	2.38	2.64	2.77
Number of passengers carried	No.	4,488,052	4,672,335	4,881,476

Average number of passengers per train-mile	No.	6.04	6.35	6.01
Goods Traffic				
Receipts from goods traffic, exclusive of demurrage on goods	$	205,548	241,353	385,516
Receipts per mile open	„	1,011	1,187	1,897
„ „ per week	„	19	23	36
Goods train-miles run	No.	167,364	169,849	265,594
Average receipts per goods train-mile	$	1.23	1.42	1.45
Piculs of goods carried, excluding livestock	Piculs.	4,637,942	5,268,144	8,205,853
Average number of piculs per train-mile	Piculs.	28	31	31
Working Expenses				
Cost per mile open	$	6,843	7,332	8,388
„ „ per week	„	131	141	160
Total working expenses for both goods and passengers, deducting from them telegraph, special and miscellaneous receipts and demurrage on goods	„	1,344,215	1,424,601	1,663,412
Average cost per train-mile: goods and passenger miles assumed to cost the same	„	1.48	1.57	1.54

Report by the Superintendent of Way and Works.

Mr. A. C. Clear, Superintendent of Way and Works, reported as follows:—

Construction.

Woosung Forts.—A passenger Jetty with 40'-0" frontage has been erected at the South West end of the concrete sea wall to enable passengers from ocean going steamers to proceed to Shanghai by train. This was a much needed accommodation, being especially useful to naval men. A 10'-0" depth of water is obtainable at lowest spring tides, and the site being carefully chosen in consultation with the Harbour Master safe landing is possible for passengers from launches or tenders of considerable size under almost any weather conditions.

Goods Sheds.—Upon the opening of the Tientsin-Pukow Railway, goods traffic developed so rapidly that urgent steps had to be taken to provide additional goods shed accommodation. It is not of the permanent nature that could be desired nor can it be considered adequate even for present needs. Owing to shortage of funds the following only could be given:—

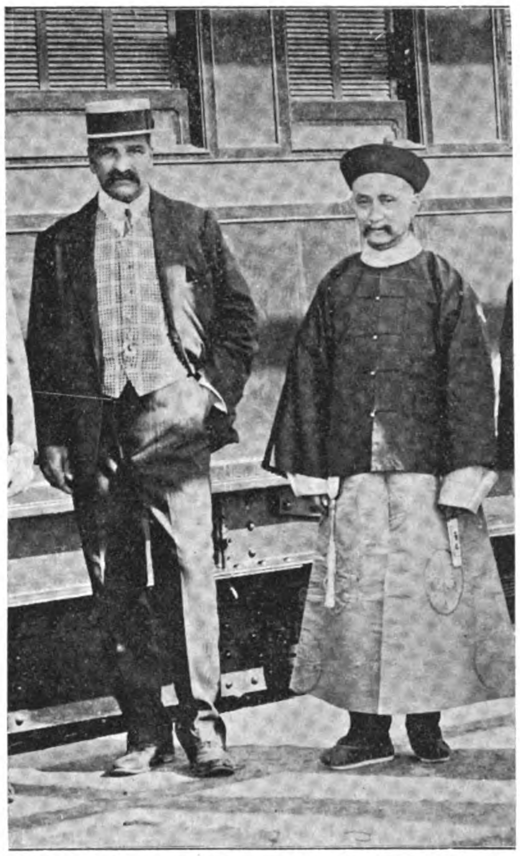
Shanghai.—Present goods shed extended to the fullest extent the site permitted 170'-0" × 45'-0" over awning.

Markham Road.—New goods shed 500'-0" long by 55'-0" wide over awnings.

Nanking.—New goods shed 200'-0" long by 45'-0" over awning.

Nanking Wharf.—The provision of a small goods shed and sidings at the riverside proved of such utility that immediate extension was essential. To obtain the maximum accommodation at the minimum of time and expense, a scheme for a dock 1,100 feet long by 200 feet top width by 30 feet deep was proposed and is now being carried out. By this scheme instead of "end on" loading, with its well known limitation and difficulties, only 200 feet of the river frontage is taken up by the opening to the dock, and "side on" loading will be possible from a water frontage in the dock of 2,200 feet, giving a loading capacity of over 150, 30 ton wagons from 3 lines simultaneously, all practically within (at any level of the river) 100 feet from boat to wagon, this being the maximum load a coolie will carry without additional payment. The necessity of extensive accommodation here had long been foreseen, but partly owing to lack of funds, sanction was not accorded until it was imperative. It is to be hoped that the excellent prospects of considerable traffic here will not have been jeopardised by the delay in putting this work into hand or the inconvenience under which the present traffic is being worked.

Extensive filling is very necessary here and at the Nanking terminus station.



A. W. U. Pope, C.I.E. General Manager — Mr. Chung Mun-Yew Managing Director

New Bridge.—In consequence of inadequate water opening at Mile 146¼ floods were of annuul occurrence and considerable damage was done to the surrounding country. A new 20 feet bridge has therefore been built through the bank, which is 26 feet high at this place. Special arrangements were made to carry this work out with the least possible interference with the Traffic working. It is satisfactory to record that no stoppage or delay of any kind occurred, the work being completed in a little over one month.

Revenue Works

Woosung Creek.—A temporary footway has been attached to the existing bridge over the Woosung Creek until the public road bridge is repaired.

Woosung Locomotive Works.—One new 15-ton spring testing machine has been put down. The roofing and ventilation of the shops is far from satisfactory; this is being attended to as funds permit. Reinforced concrete lifting blocks have been put in for carriage work.

Woosung Wharf.—One of the two seed cleaning machines has been installed in the godown, the other is under erection. Both will be belt driven by electric motors. These have been provided as an incentive to traders, particularly for sessamun seed traffic. From quarterly soundings taken along the bunding no appreciable change has occurred either from scour or silt. The cutting away of Pheasant Point opposite is rendering our property safer and easier of approach by diverting the force of the tide away from our bank of the river. The facilities provided at Woosung for the shipment of cargo are gradually being realised, and there is every possibility of this wharf developing into a most valuable and useful property. The proposal to develop Pukow as a port and its possible effect on this Railway is receiving the closest attention. Woosung is capable of being developed without any very great expenditure to meet the joint needs of the Tientsin-Pukow Railway, and this Railway as a Port for some years to come. The provision of a suitable wagon ferry from Pukow to Nanking is a factor of the first importance. Schemes are under preparation to provide this accommodation at a minimum cost.

Shanghai.—New office provided at Power house for electrical engineer and staff. Cattle dock lowered and generally improved. An improved type of sand furnace erected in the Running Shed. New Pig Shelter erected for the reception of this rather extensive traffic.

A simple system of signals for the protection of the Main Line interlocked with handworked points has been devised and works satisfactorily.

Markham Road.—A temporary matshed godown has been erected to give more storage accommodation. This is a very unsatisfactory method of meeting an urgent need, but, unfortunately funds will permit of nothing more substantial at present.

Nansiang.—An experimental system of signalling has been put down for working the straight line both ways. By eliminating as far as possible the use of loops, considerable wear and tear would be saved on permanent-way and rolling-stock.

Kunshan.—In consequence of the rotting of the timber footbridge a new one has been erected from old steel joints.

Soochow.—This engine shed roof required renewing, and as such an extensive shed was not required the size was considerably reduced, decreasing future maintenance charges and providing glass roofing for Changchow shed.

Wusih.—The whole of the goods yard has been revised now that the special arrangements made originally for dealing with tribute rice are no longer required. The sidings have been taken close down to the river front and godowns removed and rebuilt in more convenient positions. This was a much needed improvement and enables cargo to be very quickly handled, the carrying load being reduced by over 75 per cent. Shunting operations are also facilitated by the general improvement in the layout of the yard.

A new shelter for pigs has also been provided and the river frontage straightened and stone pitched throughout.

Changchow.—The engine shed has been reroofed, economy being effected by utilizing the Mellows glazing from the Soochow shed. A new approach road with timber road bridge spanning the creek has been made at the Western end of the station connecting with the new public road leading to the city.

Lucheng.—The station building was accidentally destroyed by fire and has been rebuilt.

Tanyang.—A new goods loading platform 70 feet long has been provided.

Chinkiang.—The station master's house forming an obstruction to a clear view of the goods yards was set back to the boundary, at the same time the sidings were straightened out and a dangerous gradient improved. The timber platform walls were in a dangerous condition through rot and have been entirely replaced by reinforced concrete blocks of special design. These concrete blocks are of

Z section cast separately, and can be put into position without disturbance of traffic. No foundations are required as the lower portion of the *Z* gives sufficient bearing surface, the weight of filling on this lower portion being sufficient for stability. The upper portion of the *Z* projects sufficiently far to provide a refuge between the face of the platform wall and the nearest rail, should anyone fall or be pushed off the platform whilst a train is entering the station. The cost is one-third of the existing standard brick platform walls. The maintenance charges being practically nil.

The old timber footbridge was also affected by rot and is being replaced by one with reinforced concrete approaches.

Ash pit timbers were continually being burnt and are now generally being replaced by concrete blocks.

CHINKIANG BUND.—The Jetty has been temporarily repaired and at the same time widened after being partially destroyed by a typhoon. With the opening of the Tientsin-Pukow Railway the traffic at this place may be considerably reduced so that it would not be advisable to contemplate any very extensive work here for the present.

SIASHU AND YAOHWAMEN.—These stations have been signalled as crossing places.

NANKING.—The Shiakwan bridge has been rebuilt, the opening span taken out and the road surface levelled on the old piles. A permanent bridge will soon be required here to avoid heavy annual maintenance charges.

BRIDGES.—Three arch bridges Nos. 72, 73 and 104 have been converted into girder bridges owing to the settlement of approaches bringing the sleepers down on to the crown of the arch, crushing the brickwork and giving a bad jar to traffic when passing over. This was a more economical method than lifting the line and making up banks. The saving in ballast alone being considerable.

BRIDGE NO. 44.—The piers of this bridge have been rebuilt in concrete as the brickwork failed.

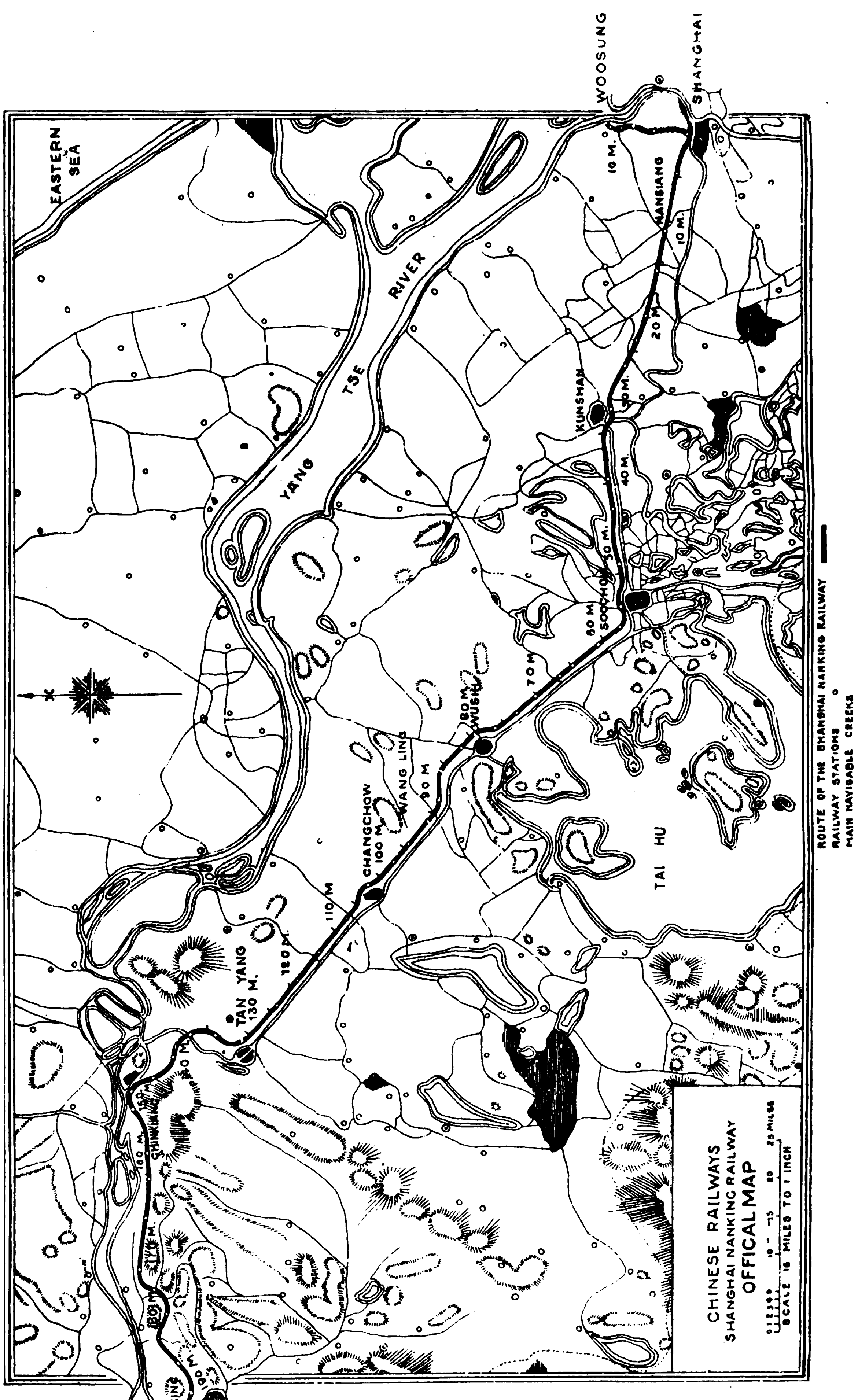
KAOTZE BRIDGE.—Owing to settlement of approaches this bridge of 40 feet span was on a sharp change of gradient, and to avoid the heavy expenditure that would have been necessary in making up formation and lifting on ballast (head room permitting) the girders were lowered 15 inches. No stoppage or delay occasioned to traffic.

BRIDGE PAINTING.—5 Major bridges have been repainted. 78 Minor bridges repainted. 35 Minor bridges covered with Bitumen Solution. Comparisons are being made between the Bitumen Solution and paint, the former being much cheaper if it has the same preservative qualities and length of service of paint.

PERMANENT-WAY.—The loops at Waikwatang and Hushukwan have been removed, not being necessary for traffic working. Crossings have been renewed at Henglin Eastern points, Wangting Eastern and Western points, and Wusih Eastern points No. 5. No. 4 sets 1 in 10 crossings have been especially strengthened and put in experimentally.

The triangle at Wusih has been entirely relaid to easier curves and a 30% saving of material effected thereby.

Owing to several broken rails a speci l detailed inspection of all permanent-way was carried out and all faulty rails noted or replaced in the line. One of the disadvantages from a constructional point of view of opening up a railway to heavy traffic before the earthwork is properly consolidated, that of ballasting on new banks, has shown up on this railway. Ballast on new banks is pressed into the formation and forms a channel or ditch underneath the line, this collects and retains water, is a fruitful source of slips, wastes a large percentage of ballast and gives an unsatisfactory roadbed needing constant attention. In order to remedy this, efficient drainage has been given to the ballast on all big banks by inserting bamboo tubes about 12 feet long 5 to 6 inches diameter,



at frequent intervals to the lowest point of ballast under the line out on to the slope of bank. Satisfactory results are noted and the cost is insignificant.

RAIL CREEP.—The system of prevention of rail creep by anchoring the rail in the centre and letting the ends have comparatively free play by lubricating fishplates has been carried out over 50 miles of line and is satisfactory in preventing further movement. The cost is much cheaper than any other system known to the writer.

JAPANESE SLEEPERS.—599 Japanese sleepers have been replaced by Jarrah on the Woosung line.

Electrical Department

TRAIN LIGHTING.—Three 3rd Class coaches were converted for use as power cars for supplying electric light to coolie coaches.

Fourteen coolie coaches were wired and fitted for attachment to the power cars.

Two 3rd Class coaches were converted into 1st Class Sleeping cars, the wiring and lighting being altered to suit.

Extension from Shanghai Power House.

SHANGHAI GOODS SHED.—Electric lighting has been installed in the new extension of this shed.

LIKIN OFFICE.—Electrically lighted.

MARKHAM ROAD.—A main was run out to Markham Road and electrical lighting supplied to the dock and godowns and also to the Station Inspector's quarters here.

SHANGHAI YARD.—All wooden arc light poles have been replaced with either light steel lattice posts or specially adapted tubular steel telegraph posts, necessitated by the timber posts rotting at ground line. The railway Hospital X Ray coil was burnt out and sent to the Power House for repair. This was a very delicate and tedious operation necessitating the highest mechanical skill, and that it was carried out successfully speaks well for the capabilities of this Department. Usually these coils have to be sent to Europe for repair, and this is the first occasion that an attempt has been made to carry out such highly skilled work in China

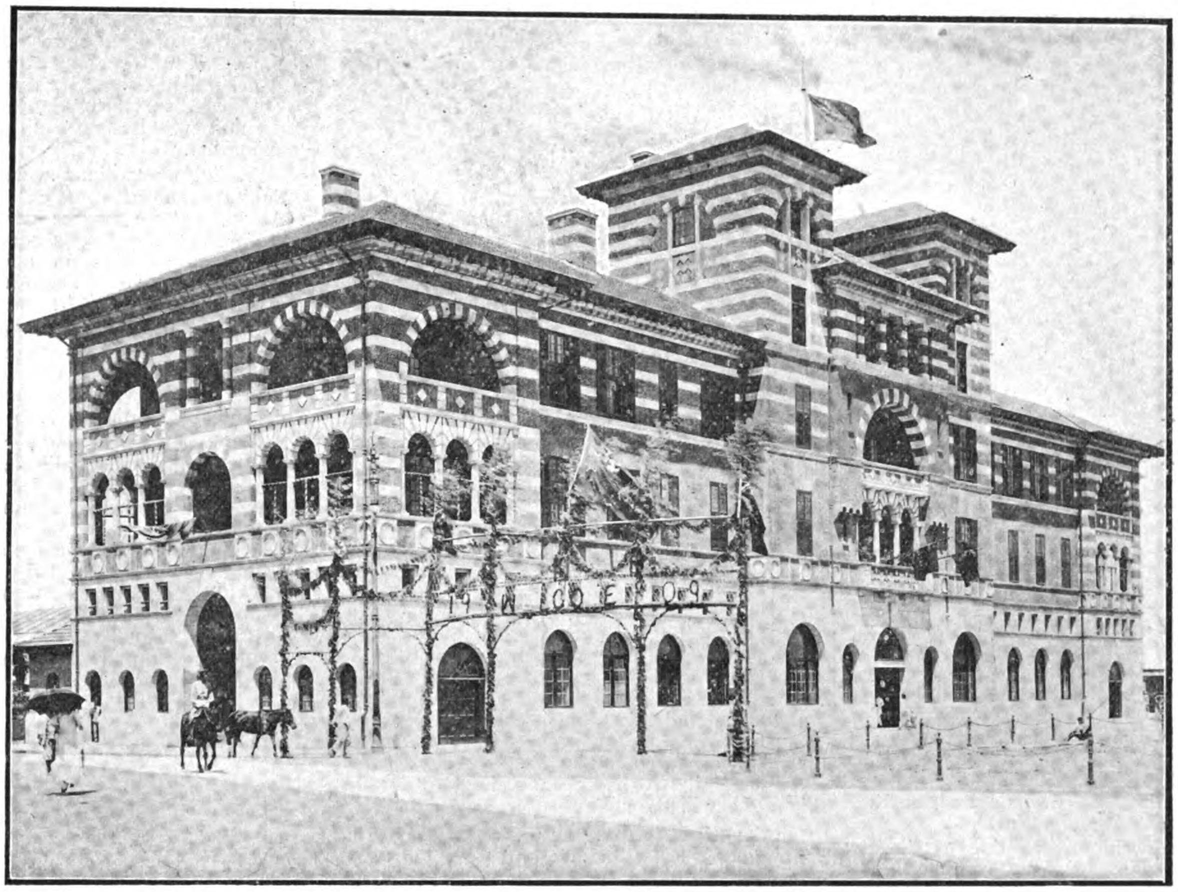
19th February 1912 are the two events chiefly responsible for the large increase in passenger earnings for 1912.

The total coaching receipts and the number of tickets sold amounted to $2,250,260 and 4,882,-173 respectively, as compared with $1,944,134 and 4,672,335 for the previous year.

The International Recreation Club's new Race course at Kiangwan has proved a great attraction to Chinese and Foreigners, and several successful meetings were held during the year.

The stretch of water at Henli, 30 miles from Shanghai, for sailing and boating is growing more popular year by year and the expenditure of a small sum in pleasure boats and rest-houses is only needed to convert this place into a fashionable week-end resort for Shanghai residents during the Spring and Autumn.

On the 1st January 1912, Dr. Sun Yat-sen travelled by special train from Shanghai to Nanking to assume the first Provisional Presidency of the Chinese Republic.



The Shanghai-Nanking Railway Station at Shanghai

Three 1st Class coaches for the Tientsin-Pukow Railway were fitted with electric light and bells complete.

The maintenance of train light apparatus generally has received careful attention and is in good condition.

Plant and Installation Work

WOOSUNG.—The Nederland Harbour Works workshop was connected up to our mains for the supply of electrical current.

Every effort is being made to attract private consumers, to reduce as much as possible the heavy power charges with which our workshops are saddled in consequence of the high capacity of the engines installed. Seldom is more than a third their capacity needed, the result being high power charges.

GENERAL MANAGER'S HOUSE.—The General Manager's house was wired complete for electric lighting consequent upon the practical re-building and enlargement of this house for the General Manager.

The following works are at present in hand:—

SHANGHAI TO SOOCHOW.—Erecting an additional line from Shanghai to Soochow for the installation of electrical train staff working

WOOSUNG.—Running mains from Power House to Goods shed and erecting motors for the seed cleaning machines.

WUSIH.—Installing electric light to Wusih station, supply being taken from town mains.

TELEGRAPH AND TELEPHONE LINES.—All poles to the above have been opened out at ground line well tarred and banked up again as a preservative measure.

Report by the Traffic Manager

Mr. J. D. Read, for the Traffic Manager, reported as follows.—

COACHING.—The opening of the Tientsin-Pukow Railway to regular traffic, and the selection of Nanking as the temporary Capital of the Chinese Republic from the 1st January to the

GOODS.—The opening of the Tientsin-Pukow Railway, the reorganization of the Likin administration whereby the taxes on rail borne traffic were made the same as by water, and the anxiety of farmers and merchants to send their goods to Shanghai as soon as the country became fairly settled after the Revolution, have created a far larger goods traffic since October than we are able to satisfactorily cope with. The fact that weighs most with merchants in giving the Shanghai-Nanking Railway the traffic in the face of the competition is that the Railway assumes the position of legal Bailee in reference thereto.

Owing to the paucity of cars we have to unload and return, loaded or empty, all cars in 5 to 6 hours, a practice which though it increases the earnings will ruin the stock, which is overworked.

In spite of every effort made to carry the traffic offering, hundreds of tons of beans have been spoiled at Nanking and Pukow owing to our inability to provide sufficient wagons. This

coupled with the fact that two or three steamers made additional trips to Nanking during the latter part of the year, gives some idea of the volume of traffic already coming down the Tientsin-Pukow Railway.

On the 15th January 1912 two Goods Compradores were appointed and they, together with the Traffic Canvassers, have done excellent work during the year in encouraging merchants to send their goods by rail and advertising our rates and regulations—in fact we owe the present spurt very greatly to them

On the 6th April 1912 arrangements were made with the Chinese Customs for the transport by rail of certain Native Exports under Transit Passes from the Treaty Ports of Nanking and Chinkiang to Shanghai. This concession as far as this traffic is concerned has put us on the same footing as the river steamers, and has resulted in a rapidly increasing traffic in Sesamum Seeds for export to foreign countries.

The total quantity of goods carried was Piculs 8,205,853 as compared with Piculs 5,268,-144 in 1911; the earnings being $387,759 or over 60% more than the previous year. These figures are satisfactory when it is borne in mind that the transport of Tribute Rice has ceased with the change of Government.

Arrangements were entered into with a Lighter Company at the end of the year for lightering goods to and from our Woosung Wharf and this has resulted in an increasing export traffic to foreign countries which we trust will soon be sufficiently large to warrant ocean steamers calling there.

The Cocoon Season was an exceptionally good one, no fewer than 149,383 bales having been carried.

Rates & Fares.—No alterations have been made in the Coaching fares during the year 1912, and on the Woosung Branch Line the fares which were inaugurated in 1910 still continue to be greatly appreciated.

The Goods rates remain practically the same as in the previous year and only in a very few instances has it been considered necessary to make any alterations to compete with the water routes.

Accidents.—During the year there were no accidents to the travelling public, but I regret to report that the number of trespassers killed and injured has increased very considerably. This is due in a great measure to the running of night trains, for so long as the Railway is used as a public highway, the increase in the train service is almost certain to be attended by additional loss of life.

Particulars of all accidents are given in the table below:—

	By accidents to trains rolling-stock permanent-way, &c.		By accidents from other causes including accidents from their own want of caution, or misconduct		By accidents whilst passing over Railway at level crossings		Trespassers		Miscellaneous, not included in preceding columns		TOTAL	
	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured
Passengers ..	—	—	5	21	—	21	—	—	—	—	5	21
Servants ..	1	1	1	2	—	2	—	—	—	—	2	3
Other Persons ..	—	—	—	—	—	—	63	25	—	—	63	25
Animals ..	—	—	—	—	—	—	—	—	4	2	4	2
Totals in all classes	1	1	6	23	—	23	63	25	4	2	74	51

The total number of people killed was 70, but *no* passengers or servants were killed from causes beyond their own control.

The particulars of the only serious accident are as follow:—

At 7.25 p.m. on the 31st October 1912, train No. 16 Down collided with a Permanent-way trolley outside Soochow Station. The coolie in charge of the trolley was killed, but the three other coolies escaped unhurt.

The cause of the accident was due to the carelessness of the coolie in charge who took the trolley out without permission contrary to all rules and regulations.

Complaints.—The only complaints received during the past year have been due to the shortage of rolling-stock, both Coaching and Goods.

Stations.—The only stations opened during the year were Woosung and Nanking Wharves.

Woosung River-side Wharf, originally opened in 1911 for the transport of Tribute Rice, was re-opened in July. From October to the end of December 1912, we handled over 5,000 tons of traffic at this station. When the value of placing goods for export and import under Bond here is realized and merchants thus save all the expense and trouble in connection with the 8 miles of river between Woosung and Shanghai, much work will be done at this Wharf.

Nanking Wharf was opened in May 1912 to facilitate the transport of traffic between the Shanghai-Nanking and the Tientsin-Pukow Railways.

Train Service.—With the exception of the night trains and the extra Goods trains, the train service remained practically the same as in 1911—the Summer Time Table taking effect from the 20th April and Winter Time Table commencing on the 1st December 1912.

On the 24th February 1912, a Night Train Service between Shanghai and Nanking was inaugurated and has proved a marked success. The twenty-two 1st class sleeping berths provided on each train have been so well patronized that it has been decided to double this number in the near future.

On the 9th May 1912, the Express Local train running between Soochow and Shanghai was cancelled.

In order to meet the heavy Cocoon traffic during the Summer, extra Goods trains were run between Shanghai and Wusih from the 1st June until the end of September 1912.

From the 10th August 1912, extra Goods trains were also arranged to run as required from Shanghai to Nanking, and vice versa, to meet the increasing Goods traffic.

A Market Gardeners' train was run in the early morning during the season, from the 28th May to the 9th November from Nansiang to Shanghai; it had to be taken off because we could not spare the cars.

Staff.—Mr. P. L. Gaussen, Assistant to the Traffic Superintendent, was granted six months' furlough on and from the 8th July 1912.

Claim.—The claims during the year amounted to $3,126—of this sum only $706 were paid for Goods damaged or lost, which speaks well for the excellent work performed by the Goods Staff including the Goods Compradores.

The numerous robber bands are taking advantage of the unsettled conditions prevailing pending the establishment of a permanent form of Government and are responsible for over one-third of the total claims paid during 1912.

Miscellaneous.—Too much stress cannot be laid on the urgent need for a ferry at Nanking, increased terminal facilities at the Goods Depots, and more rolling-stock, as the Goods traffic needs careful fostering if the Railway is to compete with the River steamers and creek native boats traffic.

The staff, one and all, have by their untiring efforts secured more traffic than we are at present able to cope with through the shortage of rolling-stock generally.

Report by the Chief Medical Officer

Dr. J. P. Ziervogel, Chief Medical Officer, reports as follows:-

The general health on the Railway has not been very good during the past year. This is attributable to the exceptionally hot summer, the epidemic of typhoid in Shanghai in the Spring and general unhealthy condition which prevailed during the months of July, August and September.

At the suggestion of the General Manager a Sanitary Committee was formed in February consisting of the Superintendent of Way and Works, the Locomotive Superintendent and the Chief Medical Officer, Sanitary rules were drawn up, and two Indian sanitary inspectors were appointed.

Special precautions were also adopted for Sanitary measures uring the summer months. Amongst these may be mentioned means for sterilizing face towels served out to Chinese passengers on the trains and the distribution to all stations of barrels and measures for mixing disinfectant fluids, with rules for its use.

During July and August there was a great deal of cholera all over the country round the Railway, but only six cases occurred among the staff. There was, however, a great deal of dysentery and diarrhœa.

In November all the permanent-way coolies were examined medically, and those with organic disease or physical defects were weeded out. Since then coolies are examined before they are employed.

The number of accidents attended with injury to persons or loss of life during the year was 125. The majority of these were trespassers. The number of accidents to employees is surprisingly small.

The following are the number of cases treated on the various sections:—

	Number treated at dispensary or visited	Number admitted to the Hospital
Shanghai	1721	122
Soochow	148	36
Chinkiang	986	77

(*Continued on next page*)

THE PEKING SYNDICATE

The Paris correspondent of the *Financial News* learns that the Peking Syndicate has personally subscribed Frs. 5,000,000, and the promoting syndicate another Frs. 5,000,000 towards the capital of the Industrial Bank of China. The balance of Frs. 20,000,000, or 40,000 shares, has been underwritten by a syndicate, and will shortly be offered in subscription preferentially to existing shareholders of the Peking Syndicate. In any case, any holder of 50 Shansi shares, or 50 Peking ordinary, or one Peking deferred, will be entitled to one share at par of the Industrial Bank of China, the board of directors of which will reside in Paris, with a general committee of direction in Peking.

Statement of Rolling-Stock *for the year ending 31st December, 1912.*

Description

Locomotives

Tender or tank	Class	Distribution of wheels	Hauling power on the level in tons	Gross weight of engine and tender in tons	Total stock at end of previous year	Additions during the year	Reductions during the year	Total stock at end of the year	Actual stock in running order on the last day of the year	Repairs and Renewals: Number repaired during the year	Repairs and Renewals: Number undergoing or awaiting repairs on the last day of the year	Average number undergoing repairs or renewals at any one time	Stock condemned in this and previous year awaiting replacement
Tank	A. 18 / 6X57	4–6–2	1,100	74.35	2			2	1	8	1	.5	
Tender	B. 18 / 6X57	4–6–0	1,100	102.35	10			10	8	27	2	.7	
Do.	C. 18 / 4X79	4–4–0	917	98.45	12			12	10	41	2	1.8	
Do.	D. 18 / 2X84	4–2–2	846	97. 8	4			4	3	23	1	.4	
Tank	Bagnall 15 / 6X43	0–6–0	705	32.50	2			2	2	2			
Do.	Am. Passr. 13.5 / 4X62	2–4–2	780	50.30	1			1	1	2			
Trav. cranes	8 ton	.....	.....	.....	1			1	1				
Do.	5 „	.....	.....	.....	1			1	1				
				TOTAL	33			33	27	103	6		

Description

Coaching Vehicles

Description	Length of underframes in feet	Tare T. Cwt.	Carrying capacity (passenger)	Total stock at end of previous year	Additions during the year	Reductions during the year	Total stock at end of the year	Actual stock in running order on the last day of the year	Number repaired during the year	Number undergoing or awaiting repairs on the last day of the year	Average number undergoing repairs or renewals at any one time	Stock condemned in this and previous year awaiting replacement
Saloon cars	52	37.16	8	1			1	1	5		1	
	68	43.16	16	1			1	1	4		—	
*Officers' saloons	32	21.16	4	2			2	2				
	42	29.16	6	2			2	2	4		.2	
	55	30. 8	12	2			2	2	4		1	
First class corridor kitchen cars	68	41. 8	64	1			1	1	13		.3	
Do. do. do. (with coupés)	68	41.18	46	5			5	5				
First and second class dinner composite cars	68	39.18	60	4		3	1	1	9		.3	
First class sleeping cars	68	36. 8	22	—	2		2	2	6			
First and second class composite cars	68	39.18	72	3	3		6	6	10		.3	
Do. do. (with longitudinal seats)	55	27. 8	70	3			3	3	10		.3	
First, second, third and brake composite cars	55	25.16	90	1			1	1	1		—	
Second class lavatory cars	68	39.18	72	2			2	1	1	1		
Third class lavatory cars	68	36. 4	100	19		2	17	16	33	1	.1	
	55	26. 8	56	4			4	4	5			
	$36\frac{5}{12}$	17. 8	52	2			2	2				
Do. do. (with longitudinal seats)	68	37.12	130	11			11	11				
Do. do. (with guard's compartment)	68	37.12	120	3			3	3				
Do. cars (without lavatory)	$36\frac{5}{12}$	17.10	56	2			2	2				
Do. brake and luggage composite vans	68	36. 8	60	4		1	3	3	7		.1	
Do. do. and large luggage van	68	36. 2	40	2			2	2				
Do. do. mail composite vans	68	37. 2	40	3			3	3	8		.1	
Do. do. luggags vans	55	26. 2	40	2			2	2	1			
Luggage and treasure vans	68	35.18	—	1			1	1				
Brake, mail and luggage vans	68	35.18	—	—	1		1	—		1		

Brake and mail vans.	36$\frac{5}{12}$	17. 2	—	2			2	2			
Covered goods, bogie, steel.	38	16.19	30	40		2	38	38	41		1.8
Do. do. (fitted for poultry) . .	38	17.0	30	—	2		2	2			
Do. bogie, steel sides, wooden tops and roofs	38	17.0	30	50			50	49	35	1	1.3
Do. bogie, steel sides, wooden tops and corr. iron roofs	38	15.8	30	21			21	21	34		.7
Do. four wheeled, steel	22½	9.14	21	16		3	13	13	5		.1
Do. do. (fitted for fish) . .	22½	9.14	21	—	3		3	3			
Do. do. (fitted for ice) . .	22½	10.0	21	4			4	4			
Do. do.	18	9.11	15	—	2		2	2			
Do. do. steel sides, wooden tops and roofs	18	9.10	15	4			4	3	1	1	—
Medium sided wagons, bogie, steel	38	14.5	35	42			42	39	83	3	5.2
(a) Do. do. (fitted for coolie class . . .	38	15.8	—	14			14	14	9		.2
Small sided wagons, four wheeled, steel	18	8.8	18	44		11	33	33	46		1.2
(b) Do. do. (fitted for coolie class) . . .	18	9.12	—	—	3	1	2	1	1	1	—
Do. do. (for sewage tanks)	18	8.8	18	1			1	1			
Cattle wagons, bogie, steel, sides, wooden uppers .	38	15.8	30	17			17	17	30		.9
Do. 4 wheeled, steel sides, wooden uppers	18	9.0	15	1			1	1			
Pig wagons, 4 wheeled, steel	18	9.15	15	—	2		2	2			
Horse boxes, steel	38	19.12	6	2			2	2			
Market wagons, 4 wheeled steel	18	9.8	15	—	6	2	4	1	12	3	.7
Flat wagons, bogie, steel	38	10.5	35	5			5	5	4		.1
Do. wooden	22	8.0	20	2		2	—				
Kerosene tank wagons	38	16.18	30	1			1	1			
Oil tanks, cylindrical	36	14.0	30	2			2	2	5		.2
Brake vans, bogie, steel.	38	19.12	15	10			10	9	11	1	.4
Brakedown van	32	8.0	20	—	1		1	1			
Flat breakdown wagon	32	8.0	20	—	1		1	1			
Breakdown van, 4 wheeled	18	9.10	15	—	1		1	1			
Total				358	27	27	358	345	438	13	

* One 55 ft. Officers, saloon car available for ambulance purposes.
(a) Converted into Coolie class and used entirely for passenger traffic (60 passengers)
(b) „ „ „ (32 „)
c 13 with corrugated iron roofs.

A 5,500 TON MOTOR SHIP

The twin screw motor ship *Siam*, under the command of Captain C. Jensen, arrived at Shanghai recently on her maiden voyage to the Far East.

The vessel, which is a four-masted ship of 5,500 tons gross, 2,489 net tonnage and is capable of carrying about 10,000 tons dead weight, is 410 feet in length, 55 feet beam and when deep laden has a draft of 28 feet. She is owned by the Danish East Asiatic Co., of Copenhagen, and is the largest vessel of her type which has yet visited the Far East. She was built by Messrs. Burmeister and Wains of Copenhagen, and is the first of four new ones being built for the company, the other vessels being the *Malakka*, *Annam*, and *Tongking*, and they, along with the *Siam*, will all be engaged in the Far Eastern trade.

The *Siam* is a splendid sea boat and is easily handled in the roughest sea, and in addition is far more economical to run than an ordinary steamer. On the voyage out from Antwerp she maintained an average speed of 11.8 knots per hour on a daily oil consumption of between ten and twelve tons of oil. Her full oil fuel capacity is 1,254 tons in her regular oil bunkers, while in addition she also carries 1,145 tons in the ballast tanks, so that she could come out from home, return and then make another round voyage without replenishing her oil supply.

The exhaust from the engines is by means of pipes which are fitted on each side of the mizzen mast, the outlet being well above the deck so that all offensive oil odours are avoided.

The engine room is full of the powerful machinery which propels the vessel, consisting of Diesel motors of the four stroke cycle type, with eight cylinders, while she also has motors of the two stroke cycle type for the main engines. There are banks of eight of the cylinders on each side of the engine room, The motors develop 3,000 indicated horse power, and the auxilliary engines develop 200 indicated horse power each. The engine room, owing to the total absence of coal and ashes, is a model of neatness and cleanliness, the machinery being painted a dazzling white and the exposed metal parts gleaming like silver. For the use of the engines the oil fuel is daily pumped from the bunkers to large upright tanks at one end of the engine room level with the main deck, and from these tanks the fuel is distributed by means of small pipes to where it is needed, and, in the course of reaching its destined place in the liquid fuel pumps and cylinders is cooled by means of sea water. The machinery is kept lubricated by pumps on the interior lubricating system. The oil lubricant passes through the cylinders, piston rods, cross heads, journals and guides and thence back to the tanks, where it is again used as fuel. The auxiliary engines work all the electric dynamos, and supply all the current used in the ship, no matter for what purpose, being passed through a transformer developing 220 volts, while the electric lights are only 110 volts. This current also supplies the power to the derricks and winches, etc. There is also an air compressor of twenty atmospheres which is used in starting the engines. The starting and reversing gears are all controlled by means of levers. When the vessel is going full speed ahead on 122 revolutions per minute, and it becomes necessary to reverse the engines, this is done by a set of steel arms which clutch part of the machinery and so prevent breakage. When the ship is ready to go ahead, her going astern machinery must also be ready for action or else there would be an accident. In another part of the engine room there is a boiler used for condensing salt water and turning it to fresh. This also supplies the heat to the radiators in the various rooms, saloon, etc.

INTERNATIONAL RUBBER EXHIBITION AT BATAVIA

An International Rubber Congress and Exhibition is to be held at Batavia, Java, in September, 1914. The Congress will be held from September 7th to 12th, for the purpose of studying the scientific, economical, technical and commercial questions that concern rubber culture and the industry. The Congress will be divided into eight sections, namely:—

1. Botany and Zoology.
2. Climate and Soil.
3. Culture and Crop.
4. Preparation, etc.
5. Working policy, etc.
6. Synthetic Rubber
7. Commerce, and
8. Publications.

The Secretary of the Committee, Dr. C. J. J. Van Hall, Buitenzorg (Java), will supply any information desired concerning the Congress.

The Exhibition will be held from September 8th to October 10th, 1914. Its object is to show how the culture and preparation of rubber is conducted in the principal producing countries. An exhibition of manufactured rubber goods will also be held. Applications for space must be made to the Secretary General, before November 1st, 1913.

The Exhibition is under the patronage of H.R.H. the Prince Consort of the Netherlands.

FAR EASTERN RAILWAYS

CHINA

Shantung Railway Company.—The report of the Shantung Railway Company shows that, in spite of the considerable decrease in the building materials for the Tientsin-Pukow Railway that were carried, the traffic shows a satisfactory increase. The receipts rose to $4,240,000, from $3,510,000 in the previous year, against an expenditure of $1,180,000($1,100,000). The account in marks shows that revenue and interest total Mks. 8,990,000 (against Mks. 6,590,000), and expenses Mks. 2,460,000 (Mks. 2,040,000). After various appropriations there is a net profit of Mks. 5,596,297 (against Mks. 4,333,458). The reserves receive Mks. 529,297 (Mks. 415,086), the Government Mks. 116,235 (Mks. 51,789), and Board of Directors Mks. 103,118. The dividend of 7½ per cent. (6 per cent.) absorbs Mks. 4,050,000 (Mks. 3,240,000), and the profit-sharing certificates Mks. 670,000 (Mks. 270,000), or Mks. 12.50 (Mks. 5) each. There remains a balance of Mks. 122,793 (against Mks. 304,791) to be carried forward.

Pukow-Sinyangchow Railway.—The *Asiatic Daily News* has the following about this line: It is reported that a Draft Agreement has been drawn up and that as soon as it is sanctioned by the Ministries of Finance and Communications and passed by the National Assembly, a proper Agreement for the Loan will be signed by the parties concerned. The following are some of the important terms of the Draft Agreement:—

(1) *Use of the proceeds.* The proceeds of the Loan shall be used as capital for the construction of the Railway line from Pukow to Sinyangchow.

(2) *Amount of the Loan*, £3,000,000.

(3) *Discount*, 5½ per cent.

(4) *Banking Commission*, 2½ per mille.

(5) *Interest.* 5 per cent. per annum, to be payable half-yearly.

(6) *Time of payment of the Loan.* The Bonds of the Loan shall be issued and sold within six months after the signing of the Agreement. If funds are required before the sale of the Loan Bonds, the borrower may ask the Syndicate to make advances, but the amount of such advances shall not exceed £,200,000.

(7) *Time of repayment.* The repayment of the principal of the Loan shall commence from the 11th year, and the Loan is to be repaid in 30 years. If the borrower desires to repay the loan fully before the stipulated time, he may do so by paying an additional sum of 2½ per cent.

Canton-Hankow Railway.—The railway from Hankow to Canton and Szechuan will be under the direct control of the Ministry of Communications. Vice-Minister Feng Yuan-ting has been ordered to proceed at once to Hankow to take charge of it for the government. Chen Tien-yao (Jeme Tien-yow) will remain managing director and will act at the same time as expert of the Ministry.

Railway Progress Round Canton.—Considerable progress is reported in the surveying of the line northwards from Shiuchow viâ Pingshek, and over the mountains in the Hunan province. This line from Canton is now open as far as Yingtak, though, as usual, the station is some distance from the city and the other side of the river. At this point there is some difficulty in regard to bridging a rather wide river; but when this is finished, another piece of line will be opened of considerable length, for the navvies have been laying down rails all the time, so that when the difficulty of the river is conquered, the line to the north of it, as far as Shiuchow will almost be ready for the engine.

Then from Shiuchow to Pingshek surveyors have been at work, and the line of the track has been decided upon, though there does not appear to be a great deal of eagerness to get this part done until the people of Hunan are farther advanced with their end of the work, for there cannot be much traffic between this town and Shiuchow. The country is mountainous, the people are scattered; and local trade is not extensive. The main point is, however, that there are hopes that Shiuchow will be open to the outside world by rail by the end of this year.

The Cantonese are further clamouring for permission to build a branch line from Shek-lung, on the Kowloon-Canton line, to Tsang-shing on the East River. This is a populous town, and the line would pass through a rich district, though at present a very disturbed one. Anyway, if there is a railway running directly into the midst of the district, it will improve matters. The distance is not great, something less than twenty miles, and the country is as level as a billiard table.

Yunnan Railways.—A correspondent writing to the *Shanghai Mercury* under date May 26 says:—There is some stir in railway matters again and Mr. Dawley, the American engineer-in-chief, has been re-engaged for a further term of two years. The main question again appears to be funds. On paper there is ample money to build the short road to Kochiu from Mengtze, but the parties in charge of the money have reinvested it so that of actual cash there is less than the public thinks there ought to be, so we are in a turmoil of mutual recrimination. Sundry inconvenient posters are out, asking pertinent (or impertinent whichever way you choose to take it) questions along this line and as criticism is the last thing a Chinese desires, there is much uneasiness and threats of resignation, etc.,—meanwhile no railroad work goes on.

SHANGHAI-NANKING RAILWAY

The following figures of traffic returns (approximately) for the week ended May 17 are issued by the Shanghai-Nanking Railway:—

For the week.

Year.	Passengers.	Goods and Sundries.	Total for the week.
	$	$	$
1913	48,356	9,456	57,812
1912	45,604	7,232	52,836
Increase.	2,752	2,224	4,976
Decrease	—	—	—

For nineteen weeks.

Year.	Passengers.	Goods and Sundries	Total
	$	$	$
1913	966,950	191,080	1,158,030
1912	961,062	106,011	1,067,073
Increase.	5,888	85,069	90,957
Decrease	—	—	—

Week ended May 24:—

For the week.

Year.	Passengers.	Goods and Sundries	Total for the week.
	$	$	$
1913	45,195	9,615	54,810
1912	45,483	7,955	53,438
Increase.	—	1,660	1,372
Decrease	288	—	—

For twenty weeks.

Year.	Passengers.	Goods and Sundries	Total
	$	$	$
1913	1,012,145	200,695	1,212,840
1912	1,006.545	113,966	1,120,511
Increase	5,600	86,729	92,329
Decrease	—	—	—

Week ended May 31:—

For the week.

Year.	Passengers.	Goods and Sundries.	Total for the week.
	$	$	$
1913....	42,037	10,306	52,343
1912....	43,660	8,638	52,298
Increase.	—	1,668	45
Decrease	623	—	—

For twenty-one weeks.

Year.	Passengers.	Goods and Sundries.	Total.
	$	$	$
1913....	1,054,182	211,001	1,265,183
1912....	1,050,205	122,604	1,172,809
Increase.	3,977	88,397	92,374
Decrease	—	—	—

Week ended June 7:—

For the week.

Year.	Passengers.	Goods and Sundries	Total for the week.
	$	$	$
1913....	45,387	10,577	55,964
1912....	41,883	18,679	60,562
Increase.	3,504	—	—
Decrease	—	8,102	4,598

For twenty-two weeks.

Year.	Passengers.	Goods and Sundries.	Total.
	$	$	$
1913....	1,099,569	221,578	1,321,147
1912....	1,092,088	141,283	1,233,371
Increase.	7,481	80,295	87,776
Decrease	—	—	—

Anking-Chengyangkuan Railway.—It is reported that a Provisional Agreement has been signed between Kuan Kwang-non, Hong Mun-kuei and others with a Japanese firm for the construction of a line between Anking and Chengyangkuan, a distance of about 500 li. It was about eight months ago that the residents of Chengyangkuan began to organize a company to construct this railway. The approval of the Chamber of Commerce at Anking was first secured. Negotiations with the Japanese firm in question were opened up about six months ago. About the end of April, the Provincial Assembly sanctioned the construction of the line by the company that had been organized, and this sanction was endorsed by the Tutuh. The proposal met with opposition from Mr. Liu Woo-kong, the Industrial Director at Anking, who claimed that the line would interfere with the Pukow-Sinyang project. However, the proposal was forwarded to the Board of Communications, but so far, we understand, no reply has been received.

It is stated that about six weeks or two months ago, a preliminary contract was signed by the Chinese company and the Japanese firm alluded to. This contract is said to be substantially as follows:—

CLAUSE 1.—A and B make this preliminary loan agreement in connection with the Anking-Chengyangkuan Railway. The loan is for......

CLAUSE 2.—The loan will be secured by the Rice Tax, and the proceeds of the tax will be mortgaged to B.

CLAUSE 3.—The preliminary advance of the loan will be at a discount of......and carry interest of......

CLAUSE 4.—A and B will work mutually and proceed with the work without undue delay.

CLAUSE 5.—A survey of the whole line will be first made, after which an engineering estimate of the cost will be submitted. B will recommend to A the necessary engineers and assistants, and A will make separate agreements with such engineers and assistants. If the men recommended are not suitable, A has the power to consult with B and change them. Salary and passage money are fixed in the agreement.

CLAUSE 6.—This preliminary loan is deposited in a bank agreed upon by A and B. The Adviser's approval must be given before this money can be drawn.

CLAUSE 7.—After this agreement is signed, A must engage B as Adviser for A's company and all the matters in regard to the railway company in reference to traffic and management must be decided upon after consultation with this Adviser. There must be a separate agreement with the Adviser.

CLAUSE 8.—After this agreement is signed, A must open two temporary offices, one in Shanghai and one at Anking, and also must make provision for an accountants' office at Shanghai.

CLAUSE 9.—If the sum lent is not sufficient, A can consult with B and B will make arrangements.

CLAUSE 10.—Work shall be started after the survey of the whole line is complete and the estimate supplied by B's engineer shall have been approved by A.

CLAUSE 11.—After the survey is made and the estimate is presented and approved, the second loan can be negotiated. This loan will be arranged by B for A.

CLAUSE 12.—The first loan is to be paid back to B when the second is paid over.

CLAUSE 13.—If after the whole line is surveyed, B should find that the loan would be unprofitable, B can cancel the agreement with A, who will pay back the first loan, capital and interest.

CLAUSE 14.—The second loan is payable as required for construction.

CLAUSE 15.—The second loan has a discount of......and interest of......per annum, payable each six months.

CLAUSE 16.—All the money is to be drawn and paid back at Shanghai.

CLAUSE 17.—The second loan is also to be deposited in a bank at Shanghai to be mutually agreed upon. When money is drawn, such withdrawal must be sanctioned by the Adviser.

CLAUSE 18.—The question of the repayment of the principal and interest is to be discussed after the estimate of the cost of construction has been obtained.

CLAUSE 19.—The whole of the machinery, materials, and buildings, and any other properties of the company, and also the profit working and the Rice Tax are the security to B.

CLAUSE 20.—All the materials required will be purchased for A by B by public tender, B receiving 5% commission.

CLAUSE 21.—For the construction of railway station, tunnels, bridges and other engineering work, the company will invite public tenders.

CLAUSE 22.—The Adviser has the right to recommend persons to be employed subject to the approval of the general manager and sub-manager.

CLAUSE 23.—The accounts of the company must be kept according to foreign method. Chinese or foreigners can be employed in the accountants' department.

CLAUSE 24.—A copy of the traffic accounts and the yearly report of the company must be sent to B.

CLAUSE 25.—The proceeds of the loan cannot be used for other than railway purposes.

CLAUSE 26.—Chinese students who have been educated in foreign countries or who have had experience in other railway companies may be employed.

CLAUSE 27.—After this agreement is signed, A cannot negotiate a similar agreement with anyone else. If before this agreement was signed, A has negotiated an agreement with anyone else, B takes no responsibility.

We are informed that the amount advanced in the first instance was nominally $50,000, but actually $48,000 and that the interest was about 7%. It is also stated that the bonds of the main or second loan were to be fixed at 91 and hat the interest was to be 7%.

This alleged agreement, we are officially informed, has not been brought before the Chinese National Railway Corporation, to which all such instruments have to be submitted. Negotiations, we are told, are still going on.

The Yuet Han Railway.—The official opening of the extension of the Yuet Han Railway to Ying Tak took place on May 10. The party, consisting of about 14 European and 800 Chinese guests, left the Wongsha Station at 8.45 a.m., arriving at Yin Tak at 1 p.m. On arrival at Ying Tak, tiffin was served in a large matshed specially built for this purpose. Photos of the principal guests were taken before the departure from Ying Tak, and the train left on its return journey at 2.45 p.m., arriving at Wongsha at 7.50. The train was in charge of the Traffic Manager, Mr. Wong, who did his best to make the outing a success. This addition to the line ought to be of great benefit to Canton, as there is sure to be a lot of traffic up and down, especially as faster trains are being put on.

Soochow-Chiahsing Railway.—Negotiations are in progress for the turning over of the Soochow-Chiahsing Railway to the Government, and it is reported that the Government intends to appoint Chung Mun-yew as the Director of this line.

JAPAN

New Japanese State Railway Locomotives.—The State Railways of Japan for their heavy grade mountain service have adopted a new type of Mallet locomotive. The engines, twenty-four of which are at present being delivered by the American Locomotive Company, are the second most powerful locomotives that have ever been put in service on a "narrow-gauge" road, and it is expected that through the employment of these large units, the operating efficiency of the heavy grade sections can be considerably increased.

The characteristic feature of the "Mallet" locomotive is that it has two separate sets of driving wheels, each complete with its own cylinders, valve gear, etc.; in reality being nothing more or less than two locomotives under one boiler. The power of a locomotive is indirectly limited by the number of driving axles which it is possible to successfully incorporate in the design while still producing a unit which will easily pass through a Railway's existing curves. The "Mallet' locomotive, by virtue of having the driving axles divided into two separate systems, the first of which is free to turn when the locomotive passes through a curve, can have practically twice the number of axles which it is possible to put under an ordinary locomotive. The new locomotives have six driving axles as compared with four, the greatest number possessed by any of the Railway's present units of motive power.

In connection with the "Mallet" design of locomotive it is interesting to note that whereas the abstract idea as to the potential possibilities of an engine of the type, was first put forth by a Frenchman, Monsieur Mallet, many years ago, it has remained for engineers of another nationality to put the idea into practical form. In 1904 the American Locomotive Company constructed its first Mallet articulated compound locomotive for the Baltimore & Ohio Railroad; and because of the ability of this engine to successfully meet the requirements of the most exacting service, the type has been introduced as a standard on practically all of the principal American railways. In addition to contracting several hundred of these engines for American railways, the American LocomotiveCompany have completed, or have under construction, engines of the Mallet type for Japanese, South Americam, South African and French railways.

Where already in service, the saving in operating costs effected by the use of the Mallet has amounted to as much as 50 per cent. as compared with the cost of operating the two ordinary engines which one Mallet universally replaces and it is to be expected that equally good results will be obtained in Japan. The railway engineers are to be congratulated for their foresight in adopting as a standard for the mountain sections, this type of locomotive, for through the employment of the engine it will be possible to not only reduce the operating expenses, but in addition to relieve, through the moving of heavier and longer trains, the traffic congestion which is particularly severe on the mountain divisions of the Imperial Government Railways.

New Light Railways.—The Imperial Government Railway Board has given charters to the Maruko Electric Railway Company in Nagano prefecture and to the Kawamiya Railway Company in Kagoshima prefecture for the construction of light railways. The Maruko Electric Railway will connect Maruko village in Ogata district, Nagano prefecture. The length of the Railway will be 5 miles, with a gauge of 3 feet 6 inches. The company was promoted by Mr. Kudo and six others with a capital of 250,000 *yen*. The Kawamiya Railway will run between Hirasa and Miyanoshiro, two villages in Satsuma district, Kagoshima prefecture. The mileage of this railway will be 19 miles and the gauge 3 feet 6 inches. The railway company was promoted by Baron S. Narahara and seventy-six others with a capital of 600,000 yen.

Railway Extension.—The new lines of railway, now under construction, will, according to Mr. Furukawa, the newly appointed Engineer-in-Chief of the Railway Board, be proceeded with as originally planned in spite of the administrative readjustments and the proposed reduction in the construction appropriations for the current year. They are expected to be completed by the end of the year and will have a total length of 240 miles, as follows:

	SECTION	MILEAGE mile.
Sendai	Kagoshima to Sendai......	31.04
Miyazaki	Kobayashi to Aoidake	35.35
,,	Miyazaki to Kiyooka......	5.61
Saeki	Oita to Saeki	48.58
Takashima	Kawada to Ikeda	25.27
Tadotsu	Tadotsu to Kwanonji	16.50
Tsumano	Yamaguchi to Sasame	3.58
Hamada	Imaichi, Idzumo to Nima..	26.55
Boso	Ohara to Katsuura	8.55
Hojo	Kisaradzu to Kadzusa-minato	10.55
Ganetsu	Yamato to Uwage	41.30
Murayama	Shibata to Murakami......	20.57
Taira	Koriyama to Ono-Shin-Machi	30.34
,,	Taira to Kawasaki	18.45
Shinsho	Imadeyama to Naruko	13.37
,,	Shinsho to Sema..........	12.58
,,	Shinsho to Sakata	34.40
,,	Sakata branch line	1.53
Soya	Onikopu to Kawitombetsu..	9.39
Shimofurano	Takikawa to Shimofurano.	35.72

LIGHT RAILWAYS.

	SECTION.	MILEAGE. mile.
Wakabetsu	Rukeshibe to Shimoikutahara	18.31
Maoka	Maoka to Nanoi	7.36
Kamiiso	Kamiiso to Garyokaku	5.64
Manji	Shibuni to Manji, and from Shibusui to Takinoue	7.11
Funakawa	Oiwake to Takimoto	11.77
Nagai	Akayu to Nagai	11.49
Miyachi	Kumamoto to Minomikata ..	12.25
Inukai	Oita to Nakamuda	6.14

Receipts of Japanese Government Railways.—The receipts of the Government Railways during the month of April amounted to 10,491,219 yen, of which 5,856,695 yen was from passenger traffic and 4,634,524 yen from freight traffic. The figures show a decrease of 144,795 yen on passenger traffic and an increase of 224,681 yen on freight traffic as compared with

the corresponding month of last year. The average receipts per mile in one day was 66.87 yen which is a decrease of 1.78 yen as compared with the corresponding period of 1912.

New Railway Lines.—The Kyosei Electric Railway Company at a general meeting held recently, authorized the board of directors to raise 750,000 yen, either by a bond issue or by borrowing, for the purpose of building the Kanamachi line and a line between Ichikawa and Funabashi. The Kyosei Railway starts from Oshiage, Honjo, and proposes to reach Narita.

Japanese Railway Funds.—In regard to the expenditure to be defrayed this fiscal year for the extension and improvement of the State railways, Mr. Tokonami, President of the Imperial Japanese Railway Board, says that the estimated revenue is some 33,000,000 yen, of which 18,000,000 yen is net profit, and 15,000,000 yen advance from the Deposit Bureau. This falls far short of the expenditure required for the satisfactory improvement of the railways, which amounts to at least fifty million yen. With a fund of only thirty million yen or so placed at the disposal of the authorities therefore, much cannot be expected this fiscal year. The authorities in the Department of Finance are quoted by the *Hochi* in this connection as stating that the Railway Bureau seems to be greatly dissatisfied with the estimated revenue this year, and not without reason, for besides the extension and improvement projects to be carried out there are schemes postponed from the preceding year, the expenditure on which aggregates something like fourteen million yen. The Finance authorities being well aware of these conditions wish to advance as much to the Board as possible, but the deposits in the postal savings banks, constituting the bulk of the financial resources of the Department, have witnessed a decided decrease of late years in sympathy with the general situation of the money market. In these circumstances, the Finance Department will be unable to advance more than five million yen for the current fiscal year.

Central Railway Station.—The Chuwo Teishajo (Central Railway Station) which is now under construction, is expected to be completed before the coronation ceremonies of the Emperor next year in Kyoto, and at the same time the express trains of the Tokaido line are all to arrive at the Central, instead of at Shimbashi station, though other trains will continue to arrive at Shimbashi for some time yet.

Nara Railway Projected.—Messrs. Kunisuke Okazaki, M.P., Kozo Kaino, M.P., and some others have planned to construct an electric railway line between Kyoto and Nara with a capital of 2,300,000 yen, for the conveyance of both passengers and freight between the two cities.

No Broad Guage for a While.—Mr. Tokonami, the president of the Board of Railways, recently stated that the Government, considering the financial circumstances of the country, has decided to give up the plan for widening the railway guage. As a result of this there are to be stopped all the preparations that have been or are being pushed on for the widening of the guage, including the suspension of the construction of the branch of the Tokaido line through Atami.

Expenditure for Railway Construction.—It has been decided of late that this year's expenditure for the construction and repair of Japanese Government railways should be 43,000,000 yen, which is to be spent:—15,450,000 yen for the construction of new lines, 12,300,000 yen for the repair of existing ones, 11,300,000 yen for both factories and cars, 3,400,000 yen for electricity, and 150,000 for steamers.

Double-track System of Tokaido.—The bridge works over the river Tenryu were expected to be completed in June, and the completion of the works means the finish of the entire construction of the double system for the Tokaido line.

MANCHURIA.

South Manchuria Railway—The work of replacing the 64 lb. rails with 80 lb. rails has been commenced on the section of the South Manchuria Railway between Shuangmiaotzu and Manching. A similar work was completed between Manching and Changtu last year and between Chungku and Kaiyuan in the preceding year.

As the result of the revised service-regulations of the Imperial Government Railways, the South Manchuria Railway Company has been placed under the jurisdiction of the Imperial Government Railways so far as railway matters are concerned. The Company's other enterprises, viz., mining, shipping, harbors, electricity, gas, warehousing, hotels, etc., remain under the supervision of the Board of Colonization as hitherto.

We learn, says the *Manchuria Daily News*, that, under the sanction of the Tokyo Government, the South Manchuria Railway Co. is to raise 200,000 additional shares, amounting to Yen 40,000,000. The new shares will represent half the balance of the total authorized capital, viz., Yen 100,000,000. It may be mentioned that the present subscribed capital is Yen 20,000,000, of which Yen 16,000,000 has already been called up, the last and fourth instalment of Yen 4,000,000 having been called on June 1st. The remaining Yen 4,000,000 will be called some time during the present current year As referred to repeatedly, the two last-mentioned instalments are to be employed as part of the Company's capital expenditure for the current fiscal year, which amounts to Yen 14,100,000. Yen 2,000,000 will be set aside for the same purpose from the Company's profits for the present working year. It is to supply the deficit of a little over Yen 4,000,000 that the new shares are to be offered for subscription. From what we can glean, the Company will not invite the public to subscribe to the new shares, but is inclined to allot two shares to each share held by the shareholders on the Register. One-tenth of the new share capital, viz., Yen 4,000,000, at the rate of Yen 20 per share, will be called up for payment on September 1st.

The South Manchurian Railway workshops at Shahokou near Tairen, are now completely equipped and efficiently staffed, and have started making passenger and goods cars, which are said to be nearly as good as those ordered from the best makers abroad, says the *Japan Chronicle*. As the demand for increased carrying capacity on the railway is rising by leaps and bounds, the Company proposes to construct twenty goods cars at the workshops during the current year, and a saving of about Y. 1,000 is expected on each car. The carrying capacity of the line was raised last winter to 12,000 tons per day from 6,000 tons on the reconstruction of the railway, and will be again increased by about 6,000 tons or so when the new cars are ready for service by the end of this year.

A semi-annual general meeting of the South Manchuria Railway Company, was held at the Tokyo Chamber of Commerce. Mr. Nakamura, the president of the company, in the chair, made reports upon the business condition of the company, and then the following accounts of dividend was adopted for the latter half of the year 1912-13 :

	Yen
Profit..	4,926,044
Forwarded	2,311,460
Total	7,237,514

To Wit

	Yen
Legal reserve..	246,302
Dividend on shares in Government possession	2,000,000
Dividend on other shares (6 per cent.)	540,000
Special reserve	2,000,000
Bonus, etc.	300,000
To be forwarded, ...	2,151,212

Japanese papers report that Mr. Nakamura, the president, will resign in November, when his present term of office is to expire, and will probably be succeeded by Mr. Hiraoka, the civil Governor of Karafuto. His resignation is also expected to be accompanied by some changes among directors and some other officials of the company.

Light Railways Postponed.—The *Manchuria Daily News* is given to understand that the proposed light railway line between Mukden and Jehol, which was on a fair way to the commencement of work, will be probably deferred or abandoned for financial reasons of the central treasury, despite all the efforts of Gov. Changhsilan of Mukden and Military Governor Hsiung-hsiling of Jehol. Another light rail line between Chinchow and Taonanfu, now being surveyed by a party of Chinese engineers, as reported previously, is said to have no better chances to have work started thereon owing to the same reasons.

Dairen and Port Arthur.—In order to further facilitate the communication between Dairen and Port Arthur, the South Manchuria Railway Co. is reported to have placed an order with an American company for some locomotives to be actuated by kerosene oil. These locomotives are expected to be here by the end of this year. When they are put in service, it will take only an hour for a trip either way against an hour and a half at present. The five trips each way daily, as is on the train schedule now, may then be increased to ten trips a day.

MALAYA

Penang Hill Railway.—The *Pinang Gazette* understands that the Secretary of State's approval has been given to the scheme for the construction of a railway up Penang Hill.

Work is to be commenced immediately under the supervision of Mr. Johnson, the P. W. D. engineer who prepared the plans and who is now in Penang.

The Kedah Railway.—A correspondent writing from Alor Star gives some interesting particulars in reference to the first section of the Kedah Railway. He says:—The embankment which can be seen in a straight line as far as the eye can reach, has been thrown up for about seven miles and is about half completed, and the permanent way should be laid down with trolleys running on this section in about three months' time. The river where the railway bridge will cross is about 250 feet wide and a quarter of a mile above the footbridge. The piles are not yet driven for the bridge, but a few close to the bank are in, and a wharf for landing goods is being erected on them, while close by the winches are connected up and steam gear is available for lightering goods and pile driving. There is a drainage canal on each side of the embankment, one side of which will probably be available for paddy boats. All kinds of labour are employed, Tamils and Malays at the embankment, Chinese builders and Bengalis at the wharf and pile driving. The coolie lines are clean and airy and the quarters of the staff very dry and comfortable.

SIBERIA

The Amur Railway.—A Vladivostok telegram to the *Mainichi* states that, according to Japanese who have returned from Blagovestchensk, the construction of the Western Amur Railway between Blagovestchensk and Strye-

tensk, 900 Russian miles, has been concluded and that the trial will shortly be held, the public service being inaugurated immediately afterwards. The bridging of the rivers has proved a very difficult task, and has not yet been completed. The train services will therefore be connected by ferries for the time being.

SIAM

Hua Lampong Terminus.—The *Bangkok Times* understands that the King of Siam has approved of the plans designed by Mr. E. Manfredi, of the Royal Arts Department, for the completion of the terminus of the Royal Railway Department at Hua Lampong. The new buildings, which follow the lines of Italian classic buildings, will provide a very imposing entrance to the railway station proper. This latter building has been finished for something over twelve months, but pending the Royal decision in the design for the façade, work has been temporarily stopped. It is now understood that the building of the waiting rooms to be situated on the Rong Muang road and Klong Padung side will be proceeded with at an early date. The façade will be surmounted by the Royal Monogram and underneath will be placed a large clock.

When the houses at present standing at the entrance to the new terminus are removed it will be seen that the building has been planned on a scale worthy of the importance of the northern railway system.

GENERAL

The Siam-Tavoy Railway.—A correspondent writes to *The Burman*:—"I promised to give you my opinion on the proposed railway lines which are to eventually connect with the Siamese Railway system, at Ban Pang on the River Me Klawng.

"Two alternative lines are proposed, one of which is aligned from Moulmein via Mudon, thence across a gap in the Taungmyo range to Ule, then crossing the Ataran River to Three Pagodas at Paya-thonzu, a distance of 108⅛ miles. This takes the line to within 240 miles of Ban Pang. The other is via Tavoy to Amya, 120 miles from Ban Pang. From Three Pagodas a loop can be form d on the Tavoy line by connecting it with Ye, lying direct east and west. The line to Three Pagodas will go across a tract of country in which mining for tin and wolfram is going on, and which is now being extensively utilized for the cultivation of cotton and rubber. As I told you in my last, Pya-thonzu lies at the base of a mountainous tract of neutral territory between Siam and the Tenasserim Division known as Kyaukkaung. Thither proclaimed offenders from here as well as from Siam fly for refuge. The line to Three Pagodas will, there fore, be advantageous both from an economic as well as an administrative point of view, while the other line, except for a shortness of the distance by 120 miles, has no such claim. There is an ancient Talaingi Road from Three Pagodas to Ye, by which the escaped convicts from the Andamans tried to reach Kyaukkaung a few years back."

Burma-China Railway.—The question of a railway from Burma to China, which has been raised once more by the Liverpool and Manchester Chambers of Commerce, who are preparing to take the matter up with the Secretary of State, came before the Burma Chamber of Commerce at their last meeting at Rangoon.

The Chairman explained that he had gone into this question and found that there were three possible railway routes from Burma to China. The first of these was a line from Bhamo to Tengyueh, a distance of 120 miles. This line might conceivably pay a small return on capital outlay, but its ultimate extension to Talifu was not hopeful because the country beyond Tengyueh was extremely difficult, and there was no particular trade to be tapped. The second possible route was the Northern Shan States Railway from Mandalay past Maymyo and on the Lashio. This was not a promising line, and there were those who felt that it should never have been built at all. The third possibility of a railway connecting Burmah with China was to be found in the Southern Shan States line from Thazi to Taunggyi, which might be extended eventually into China via Kengtung. This line deserved close attention as it would pass through a rich country of rolling plains possessing a soil capable of producing crops of almost any description. Moreover, this route probably afforded the easiest alignment into China and would possibly merit construction sooner or later, but the present unsettled state of China, particularly on the Burma frontier, rather forced railway proposals into the background at the moment.

It was resolved that the Liverpool Chamber be informed that the committee of the Burma Chamber have read in the Journal of the London Chamber of Commerce of the interest the Liverpool Chamber is taking in the matter of a railway from Burma to China, and will fully support any approved scheme that may be adopt d for the purpose of furthering railway connection in that direction.

TRAMWAYS

Singapore Electric Tramways.—The accounts of the Singapore Electric Tramways show an excess of revenue over expenditure of £34,439, the profit for the year, after charging debenture interest, depreciation and royalty paid, being £5,358. Compared with 1911, tramway revenue shows an increase of £1,446. There were 398,080 more passengers carried in 1912, than in 1911, the car mileage being 29,698 less. After lengthy negotiations with the Municipal Commissioners of Singapore, the company has been able to secure an extension of the arrangement under which it supplies current for lighting and power purposes.

More Bogie Cars for Tokyo.—The Tokyo Tramway system has at present 150 bogie cars running each day, and 30 more are expected shortly to arrive from abroad, while 100 more have recently been ordered abroad. On their arrival, which is expected by the end of this year, they will surely add a great deal to the facilities of the tramway system in the city.

Shanghai Electric Construction Co., Ltd.—The directors' report for the year to December 31, 1912, stated that the accounts show a profit of £24,727, which compared with £14,139 for 1911. Including the amount brought forward from the preceding year, the total standing to the credit of profit and loss account, before making any appropriations, was £28,028. There had been transferred to reserve for renewals account £8,500, and there had been applied in reduction of the preliminary expenses account £1,554, leaving a disposable balance of £17,974. The directors recommended the payment of a dividend of 5 per cent. for the year (less income-tax), absorbing £16,000, leaving to be carried forward £1,974. The percentage of loss by exchange on subsidiary coinage was higher in 1912 than 1911, but had recently shown a tendency to decrease. The loss under this head for the year was £23,937, and was almost equal to 7⅛ per cent. on the capital of the Company. The sanction of the Municipal Council of Shanghai had been obtained for a new type of motor car, and the rolling stock is being increased this year by 15 motor cars and 10 trailers.

Shanghai Tramways

The returns of the Shanghai Tramways (Foreign Settlement) for five months ended May 31, 1913, are as under:—

	1913. $	1912. $
Effective receipts (after deducting loss on subsidiary coinage)..	346,276.09	313,301.85
Passengers carried	17,270,360	15,710,639
Car miles run	1,099,619	1,123,730

The loss by depreciation of subsidiary coinage for the period was $94,462.98, equal to 22.76 per cent. of the gross cash collected on the cars, as compared with $96,521.91, equal to 25.13 per cent. for the corresponding period last year.

Week ended May 21, 1913:—

	1913. $	1912. $
Effective receipts (after deducting loss on subsidiary coinage)..	17,355.94	15,181.11
Passengers carried	884,149	783,916
Car miles run	53,410	52,762

The loss by depreciation of subsidiary coinage for the week was equal to 23.43 per cent. of the gross cash collected on the cars as compared with 25.76 per cent. for the corresponding week last year.

Week ended May 28, 1913:—

	1913. $	1912. $
Effective receipts (after deducting loss on subsidiary coinage,)	14,878.78	14,802.46
Passengers carried	761,466	732,791
Car miles run	51,884	54,021

The loss by depreciation of subsidiary coinage for the week was equal to 23.44 per cent. of the gross cash collected on the cars as compared with 25.21 per cent. for the corresponding week last year.

Week ended June 4, 1913:—

	1913. $	1912. $
Effective receipts (after deducting loss on subsidiary coinage)..	15,897.79	15,309.01
Passengers carried	817,282	773,463
Car miles run	54,385	52,637

The loss by depreciation f subsidiary coinage for the week was equal to 23.54 per cent. of the gross cash collected on the cars as compared with 25.08 per cent. for the corresponding week last year.

Week ended June 11, 1913:—

	1913. $	1912. $
Effective receipts (after deducting loss on subsidiary coinage)..	19,598.53	15,581.42
Passengers carried	1,027,802	800,503
Car miles run	57,455	53,427

The loss by depreciation of subsidiary coinage for the week was equal to 23.44 per cent. of the gross cash collected on the cars as compared with 25.32 per cent. for the corresponding week last year.

Peak Tramway Co., Ltd. (Hongkong).—The report of the Directors for the year ending 30th April, 1913, states:—

The Net Profit for the twelve months, after deducting Directors' Fees and General Managers' Remuneration and providing for loss on subsidiary coins, amounts to ..	$34,947.57
To which has to be added the balance brought forward from last account	3,402.74
Making available for appropriation..	$37,350.31

The Directors recommended that a dividend at the rate of 8 per cent. per annum be paid to shareholders, absorbing $24,000, that $12,000 be transferred to reserve fund, and that the balance of $1,350.31 be carried to a new profit and loss account.

MINING

Kailan Mining Administration.—The output of the Kailan Mining Administration's mines for the week ending May 24, amounted to 36,135 tons and the sales during the same period, to 37,769.81 tons.

Week ending May 31, output 37,140.66 tons and the sales during the same period amounted to 35,583.16 tons.

Week ending June 7 output 34,431.83 tons and the sales during the same period amounted to, 36,880.39 tons.

Week ending June 14, output 31,588.98 tons and the sales during the same period, to 33,175.81 tons.

Colorado Mining Co (P.I).—This company has declared a dividend of ten per cent. and has carried forward P.100,000.

Penchihu Coal.—The *Manchuria Daily News* hears that contracts have been signed for the sale of 100,000 tons of Penchihu coal to Japan, 50,000 tons to Shanghai, and 100,000 tons to Chosen and Manchuria, all during the present fiscal year. It is said that the Chinese warships having their base about Shanghai have also placed an order with the colliery management. Altogether demands for this coal have increased on all sides. The daily output of the colliery has now been raised to about 1,000 tons.

Philippine Exploration Co.—The result of the work on the Gumaos property (P.I.) during the month of April, was as follows: Gold recovered 1,140 oz.; approximate value P.42.00. Dredge worked for 25 days, of which 7 days were expended in working through tailings.

Kyushu Mining Co.—At the Kyushu Mining Company's regular meeting the following accounts were to be submitted :—

Net Profit	38,821.63
Brought over from last account	14,213.60
Total..	53,034.69
Legal reserve..	1,950.00
Second reserve	3,890.00
Carried to next account	47,194.69

It was expected that at the conclusion of the regular meeting an extraordinary meeting will be called to consider a proposal to float a loan to the amount of 1,300,000 *yen*, bearing 7 per cent. interest, with a view to supplying a deficiency in the working capital of the company.

INDUSTRIAL

Activity in Paper Market.—The recent increase in the demand for paper has produced, it is said, much activity in the Japanese paper market, and to meet this state of affairs, many companies are contemplating increasing their manufacturing capacity. For instance the Fuji Paper Milling Company is enlarging two of its mills in Shizuoka and Hokkaido, and it has the intention to further expand its business at the cost of 1,000,000 yen or so.

PUBLIC WORKS

Tokyo Sewerage System.—The present repairing work of the sewerage system in Tokyo was undertaken in 1911 to be completed in 1915 at the cost of 6,130,000 yen, but at a recent meeting of the Aldermanic Assembly this expenditure was increased by 670,000 yen and the period of repairing works also extended by two years.

Hospital at Cebu.—Plans have been submitted by consulting architect William E. Parsons to Dr. Victor G. Heiser, director of health, for the communicable diseases hospital which is to be erected at Cebu and operated in connection with the southern islands hospital. The building, when finished, will be one of the most handsome in Cebu and will cost about P60,000.

IRRIGATION, WATERWORKS, ETC.

Wuchang Water Supply.—A contract has been signed with the Syndicat Sino-Europeen for a complete water supply for the city of Wuchang, the capital of the Province of Hupeh. The contract provides for the erection of a complete works which will have a capacity of 4,000,000 gallons of water to commence with. The intake will be in Yang-tsze River, and the water tower will be located on Serpent Hill in the centre of the city. The estimated cost of the work is Tls. 1,500,000, and the whole contract is expected to be completed within two years.

PERSONAL

Sir John Jordan, the British Minister at Peking, left for England early in June, on furlough.

Dr. Wu Ting-fang, at the request of President Yuan Shih-kai, visited Peking in June. Dr. Wu is said to have been offered the post of Premier, while other reports state that he is to go to Washington as Ambassador.

We regret to record the death of Herr Rump, who was appointed Director of the Chinese National Loan Bureau. It is understood that Mr. Pfeiffer, of the Deutsch-Asiatische Bank at Shanghai, has assumed the duties connected with the post.

The Central China Post understands that the following appointments have been made for the German section of the Hankow-Szechuan railway:—Mr. Clement as Secretary to Mr. Linow, Engineer-in-chief; Mr. Fuchs, formerly of Wuchang, and Mr. Rump as surveyors.

Mr. H. F. Merrill, Commissioner of Customs at Shanghai, has been granted long leave, and has handed over charge of the Shanghai Staff to Mr. F. S. Unwin.

Mr. A. W. U. Pope, C. I. E., General Manager of the Shanghai-Nanking Railway, has left on Home leave. Before his departure Mr. Pope received numerous presentations and addresses of esteem and goodwill from the Chinese Chambers of Commerce of the towns served by the Railway, and from other organisations.

The Hon. Mr. Wickersham, ex-Attorney General in the Taft Administration with Mrs. Wickersham, has been visiting Tokyo and Peking.

The chief of the Chinese postal department, M. Piry, left by the Siberian route on leave recently and Mr. F. A. Aglen, Inspector-General of Customs, will take a short furlough soon. Senor Pastor, Spanish Minister to China, has returned to Peking.

Sir Everard Fraser, K.C.M.G., H. M. Consul-General at Shanghai and Lady Fraser have left for Home. Sir Everard will be away for eight months.

Mr. H. von Heidenstamm, Engineer to the Huangpu Conservancy, has left on a brief furlough

Among the recipients of honours on the occasion of the birthday of King George of England were:—Mr. B. F. Alston, who has been appointed in charge of the Legation in Peking during the absence on leave of Sir John Jordan, who was created a Companion of the Order of the Bath; Mr. S. Barton, Chinese Secretary to the Legation, and Mr. W. P. Ker, Commercial Attaché, who had conferred upon them Companionships of the Order of St. Michael and St. George. Mr. Pollock, of the legation staff, also received the C.M.G.

Dr. Gatrell of Peking, has received from the President the 4th Chiaho Order.

The *Journal de Pekin* states that Mons. de Martel, secretary of Embassy, will succeed Mons. Fr. Georges-Picot, who is going on six months' leave, at the French Legation, Peking, and is expected to arrive early in August. He is a nephew of the celebrated Countess de Martel, the "Gyp" of French journalism, and has been in the diplomatic service since 1901.

M. Mazot, Assistant Manager of the Banque de l'Indo-Chine at Peking, has been appointed French Adviser to the Audit Department temporarily, but it is said to be doubtful whether M. Pardoux will ever take up the post.

Mr. Kingoro Nonomura, a director of the South Manchuria Railway Company, will represent Japan at the West Europe Railway Traffic Congress held at Moscow. Afterwards he will proceed on a tour of inspection through other European countries.

The Danish Minister to Peking, H. E. Count P. von Ahlevelt Laurvig has left for Europe on three months' leave.

Mr. Arthur Hyde Lay has been appointed British Consul at Shimonoseki with Hiroshima, Yamaguchi, Fukuoka, and Oita Prefectures as his jurisdiction; while Mr. Thomas Joseph Harrington has been given a similar post at Tamsui, with jurisdiction over Taiwan and the adjoining islands.

During the absence of Mr. A. W. U. Pope, C. I. E., General Manager of the Shanghai-Nanking Railway on leave, Mr. E. R. Morriss will act as General Manager and Mr. J. D. Read will act as Traffic Manager of the Railway.

Public Notification

CHINESE GOVERNMENT RAILWAYS

Shanghai-Nanking Railway

1. In the exercise of my authority as Managing Director of the Shanghai-Nanking Railway, I hereby give Notice that the public use of this Railway for the carriage of both Coaching and Goods Traffic is, and will be, till further notice, governed by, and subject to, the Bye-Laws and Regulations issued for the conduct of the same and exposed in the Premises of the Company, extracts thereof being posted in the vehicles in use.
2. Copies of such issues are available to the public on application to the Administration.
3. The substance of paragraph 1 of this notification will be printed on the backs of all Railway tickets, Goods Receipt Notes and similar documents as a condition of their issue to the public.

M. Y. Chung,
Managing Director.

Dated 5th June, 1913.
Managing Director's Office,
Shanghai.

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THE FAR EASTERN REVIEW

COMMERCE :-: ENGINEERING :-: FINANCE

VOL. X. SHANGHAI AND MANILA, JULY 1913 No. 2

THE TRIBAL AND ADMINISTRATIVE SYSTEM OF MONGOLIA

BY LIEUTENANT G. C. BINSTEED.

(*The Essex Regiment*)

This article makes no claim to originality. It is frankly gathered from the comparatively extensive Russian literature on the subject. The writer's excuse for translating and collating the information below is that but few English-speaking people are in a position to read the Russian. For the present article the writer is chiefly indebted to:

P. S. Propoff's Translation of the Chinese work 'The Records of the Mongol Nomads."

Colonel Baranoff's works on Mongolia, and

Brunnert and Gagelstrom's Contemporary Political Organization of China.

Besides, in a lesser degree, to many other Russian writers, especially those who have contributed to the Journal of the Society of Russian Orientalists (Harbin.)

Pilgrims from Khalachin on their way to Wu T'ai-shan

In considering the administrative and tribal system of Mongolia, it is essential to take some account of the historical factor. Originally a nomad people in the fullest sense, the Mongols have long been only half nomads. The various tribal organizations have become restricted to a fixed area and even the individual nomad families now only have two changes of abode a year, one for summer and one for winter, the same family usually resorting to the same two places year after year. At various points in the course of the last 300 years there have been instances of whole tribes passing from one area to another, but these are exceptions occasioned by special circumstances. In general it may be said that the various Mongol tribal agglomerations are fixed or settled, and the individual Mongol semi-settled, and in some parts even wholly settled.

First welded into a whole by Genghiz Khan and remaining such, sometimes in reality, sometimes only nominally, for over 300 years, in 1544 on the death of Dayan Khan the Mongols were partitioned amongst Dayan's eleven sons and from that time onward were never again ruled by one man until by a gradual process of alliance, protection or conquest, the Ta Ch'ing emperors eventually were acknowledged as Bogdo Khan (or Holy Khan) of all the Mongolia of today. The development of this latter process will be touched upon more fully when we come to consider the various parts of Mongolia in detail. But we may here notice that historically, ethnographically and geographically we can distinguish three broad groups amongst the Mongols, namely: the Inner Mongols of S. E. Mongolia, the Mongols of Khalkha, the Western Mongols or Eleuths.

Roughly speaking the Mongols of S. E. Mongolia were the first to enter the Ta Ch'ing empire and as a rule did so voluntarily as the willing vassal allies of the Manchu Bogdo Khan. The great majority of their princes had acknowledged Manchu suzerainty before 1640 and the last of all in 1666.

The Khalkhas were the next to join the Manchu empire and also did so voluntarily without any compulsion from the Manchu side but under the pressure of a great danger from their kinsmen the Eleuths or Western Mongols. The latter under Galdan Khan threatened to destroy the Khalkhas as free tribes and in 1688 the Khalkha Princes by the advice of the then Urga Hutukhta placed themselves under the protection of Peking, after previously discussing the alternative of Russian protection.

Lastly the Western or Eleuth Mongols entered the Manchu empire as the result of conquest after a long period of desultory warfare ending about 1756 with the complete submission of the Eleuths. The majority of the many tribes which come under the term Eleuths are to be found in the Kobdo and Altai regions of Mongolia, in Ch'inghai or Kukunor and in Hsinchiang.

The bases of the true Mongol tribal organization are the Aimak and the Hoshun. All true Mongol ideas of government consist in the ruling of the tribe by hereditary princes whose power over the persons of their people is almost unlimited. The Hoshun is the fief of any one ruling prince, its Jassak. In Chinese it is Ch'i^2 旗 or Banner The term principality may also with reason be applied. As regards the Aimak one cannot do better than quote some lines to be found in Colonel Baranoff's Vocabulary of Mongol Terms. "Aimak......... An ancient Mongol name for the fief of a prince, being a group of one, or more principalities, which form the inheritance of one princely family. Thus the Aimak is a collection of one or more principalities bound together by singleness of descent and historical past, as the former possession of a single prince, ancestor of the various present reigning princes. With the course of time the Aimaks became divided

up into several independent principalities; none the less the connection between the latter was not broken and the Prince senior in the family is still considered the head of the Aimak." The Chinese name for an Aimak is in the case of the 4 Khalkha Aimaks "Pu,"[4] and for the Inner Mongolian Aimaks "Pu lo", 部落. It is loosely rendered in the Press as 'tribe.' The next term to be understood is the League, Chinese Meng[2] 盟, Mongol Chigulgan, Chugulgan or Chulgan. This is a non-Mongol institution designed by the Ta Ch'ings to weaken the true Mongol tribal organization and foster the gradual passage of power into the hands of the Ta Ching's nominee officials. In Khalkha the leagues were made to coincide in composition with the existing Aimaks. In Inner Mongolia, the 24 Aimaks were irregularly grouped into 6 leagues.

Mongolia proper in the administrative sense, prior to any changes which may be the result of the Chinese Revolution, consisted or consists of the following:

The 6 leagues of Inner Mongols.
The Ch'ahars.
The Kukuhoto Tumets (Kui Hua Ch'eng Tumets.)
The Alashan Mongols (Eleuths).
The Etsingol Old Torguts (Eleuths)

All the above form part of the popular expression Inner Mongolia.

To continue:

The 4 leagues of Khalkha.
The Kobdo district.
The Altai district.
The Tannu-Urianhai lands.

These latter form Outer Mongolia. But it must be remembered that Outer and Inner Mongolia are somewhat vague terms when applied to the western parts of Mongolia. Besides all the above there are the following sections of Mongols living outside what is usually understood as Mongolia, but in the former Ta Ch'ing empire:

(a) 29 hoshuns of Kukunor Mongols living in the newly formed Chinese administrative division of Ch'inghai shown on all but the most recent maps as part of Thibet. (Ch'inghai also contains a non-Mongol population of Tanguts).
(b) Various tribes of Mongol origin inhabiting Barga or Kulunber (the Hailar district of Heilungchiang).
(c) The Mongol Leagues of Unen-Sutzuktu and Batu-Setkhiltu in the province of Hsinchiang or the New Dominion consisting of Old Torguts and Hoshuts, both of which are Eleuths, in all 13 hoshuns, inhabiting the valleys of the Yuldus and Kobuk rivers, Kur-Kara-usu and the neighborhood of Kuldja.
(d) Some Ch'ahars on the R. Borotala in Hsinchiang (N. of Ili..)

To pass to the detailed examination, of these political divisions of Mongols.

The six Leagues of Inner Mongols.

The names of these 6 leagues are: Cherim, Chosotu, Chou Uda, Silingol, Ulan Ch'ap, and Ikh Chao or Ordos.

(In transliterating Chinese characters the Wade system is here followed. This does not apply to Mongol names.)

As stated before they all contain one or more of the original Mongol Aimaks of which there are 24 in the 6 Inner Mongol Leagues. Each Aimak again contains one or more hoshuns. Each hoshun has its ruling prince known as Jassak; the senior in ancestry of the Jassaks of each Aimak is still recognized by the Mongols as historical chief of the Aimak, but has now left to him no authority and no duties in this capacity. All such authority has been transferred either to the Ta Ch'ing institution of the President or Captain-General of the League (Mongol Chigulgan Darga or Daruga; Chinese Meng Chang or 盟長), or to one of the great Chinese officials who severally supervise the affairs of one or other of the Mongol Leagues. The Office of Chigulgan Darga, though filled by one of the Jassaks, is not hereditary, but elective. He is chosen by the Diet of the Jassaks of the League and has to be confirmed by the Bogdo Khan (or now by the

A Mongolian nomad's yurt (tent)
Photo by Lieut. Binsteed

President of the Republic). All the Jassaks of the League meet together periodically in a Diet to settle (a) judicial affairs in which persons of different hoshuns are interested; (b) economic and administrative matters concerning the whole League; (c) Matters connected with the statistics about the League.

In Inner Mongolia under the Ta Ch'ings all positions filled by Mongols carried with them far less power than the corresponding ones in Khalkha. The greater length of time during which the Inner Mongols have been under Manchu and Chinese influence, their comparative proximity to Peking and the flood of Chinese colonists have all enabled the Ta Ch'ings,themselves,Chineseified Manchus, conquerors assimilated by their subjects, to propagate Chinese influence and institutions over their fellow-conquerors and allies, the Inner Mongols, and to turn the former war-like nomads temporarily into the most peaceful lazy and unenterprising of races by the fostering of lamaism, and by the expenses incident to Court functions and visits to Peking to force the formerly wealthy shepherd princes to enslave themselves in irretrievable debt. Thus in Inner Mongolia the Diets of the Leagues are convened by order of the Peking Government and a Chinese official is specially deputed to open the Diet, who in reality has all the powers of its president. The clerical work was done by Chinese. The President of the League or Chigulgan Darga has no power of iniative and only sees to the execution of the Diet's decisions. The Darga has no power to interfere with a Jassak in the local administration of his own hoshun. The Jassaks refer to the Darga only matters which require Imperial sanction such as appointments to official positions or conferring of titles, and specially important grave sentences for crimes. Moreover the orders and decisions of the Peking Government are transmitted through the Darga. In addition the Darga has an assistant called the Ded Darga or Fu Meng Chang. As before mentioned the control of the Chinese Government is strengthened by the fact that every one of the 6 Leagues is placed for general supervision under one or other of the great Chinese officials, Chiang Chün or Tu t'ung, whose seats lie in the frontier towns of Mukden, Jehol, Kalgan, Sui Yuan Ch'eng, etc. Of these more later on.

Before seeing how the 6 Leagues are divided into Aimaks and hoshuns, let us examine the organization of a hoshun. The Jassak or Ruling Prince inherits his office by primogeniture and was confirmed by the Emperor. The great majority of Jassaks claim descent from Genghiz Khan or his brothers, or at any rate from the same stock. When the Ta Ch'ings took the various Princes under their protection they confirmed them in their rights of ruling their own hoshuns and conferred upon them Manchu titles of nobility. Thus all Jassaks belong to one of seven orders of nobility, namely: (Hosho) Ch'in Wang; (To lo) Chün Wang; (To lo) Pei le; (Ku Shan) Pei tzu; Chen Kuo Kung (or Mongol, Ulusun Tushé Kung); Fu Kuo Kung (Ulus-tur Tusalakchi Kung); 1st class Taiji. The Ta Ch'ings, however, reserved to themselves the right to remove a Jassak from the administration of his hoshun for conduct unbecoming a Prince. Each hereditary title of nobility carries with it a varying yearly allowance in taels and cloth material and also entitles the holder to a certain suite of attendants of a certain number and various such like privileges. The Mongols are particularly fond of titles and privileges and the Ta Ch'ings consequently obtained great success in their policy of weakening the Mongol princes by the fostering of mutual jealousies and rivalries. The various titles have been conferred and taken away on the slightest of pretexts.

Every Jassak of the Inner Mongols has to appear in Peking once in three

years to attend the New Year Court functions. Their turn to come was settled by the Li fan yuan (now Bureau of Mongolian and Thibetan Affairs.)

The Manchus also used the policy of marrying Imperial Princesses to Mongol Princes to bring the latter under Chinese influence.

The Taiji are such hereditary nobles of Mongolia as have not received any of the six Manchu titles. The Taiji are divided into 4 classes, for each of which are allowed a certain number of Khamjilga or serfs to work for them. They form a heriditary nobility of persons almost always claiming descent from a common ancestor with the Jassak of their hoshun. All Jassaks that have not one of the six Manchu titles are necessarily first class Taiji.

Besides the Jassaks there are other so-called sealless princes, *i.e.* Mongolian nobles who, though bearing Manchu titles, have no hoshun to administer. They are generally the descendants of former Jassaks who have been deprived of the seal of office. In the Darkhan Wang Hoshun of Cherim League, there are no less than six such princes besides the Jassak; these six including a Ch'in Wang and a Chün Wang.

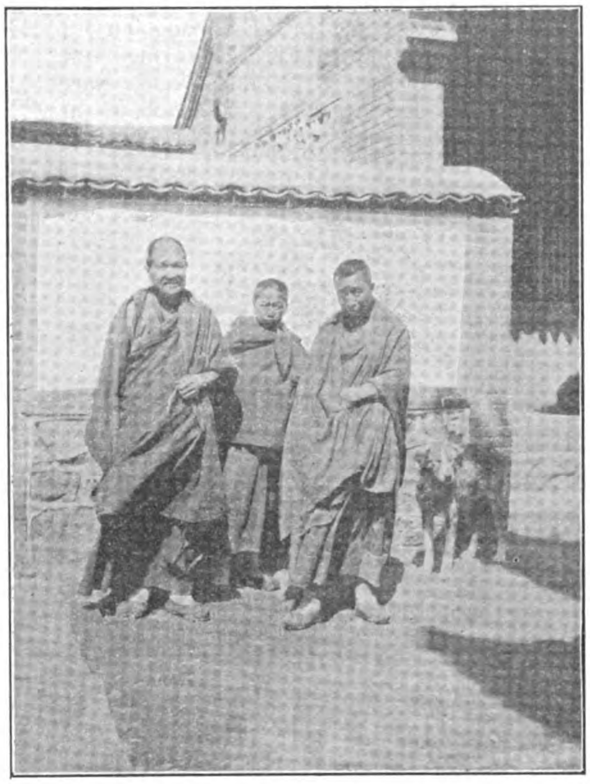
The theoretical powers of the Jassak are very great. He controls and decides all the internal affairs of his hoshun. His subjects are practically his serfs, whom he may give away as dowry or as presents to Hubilgans, Gegens and Hutukhtas (various grades of living Buddhas). He distributes the various state corvées to be furnished by his hoshun and decides disputes between his subjects. But in practice many Jassaks do little or none of the above in person. The experience that primogeniture does not always ensure suitable rulers has led to the institution of official posts, the occupants of which generally manage in reality the affairs of the hoshun.

The chief of these officials are:

The Tusalakchi Taiji or, in Chinese, Hsieh Li Taiji, Civil Assistant of the Jassak. They are, nominally at any rate, chosen by the Jassak, from amongst the Taiji and, on the recommendation of the Chinese superintendent of the League, are confirmed by the President of the Republic (*i.e.* formerly the Bogdo Khan or Ta Ch'ing Emperor). They generally have a dominating influence in the hoshun, and rule it altogether in the Jassak's absence or minority, or pending the confirmation of a new Jassak after the death of the last. There are generally two Tusalakchi, and sometimes more in a hoshun, but only one usually administers the hoshun at any one time.

The Tzahirakchi,—or Military Assistant (Chinese Kuan Ch'i Chang Ching) is usually chosen for his knowledge and ability from amongst the Non-Taiji or common Mongols of the hoshun. He nominally looks after the militia which the hoshun is liable to supply for the service of the Bogdo Khan. For this purpose, and also for general administrative purposes, the hoshun is divided into a varying number of Somons (or Sumuns), each nominally supplying 150 horse warriors. The Somon is under a Tzangin or Tso Ling. Six Somons form a Tzalan. There are other officials both at the Prince's headquarters and in the Somons, which, however vary very greatly in different parts and need not detain us. All the above officials are chosen by the Jassak, and their practical peace work in reality consists in tax collecting, criminal catching and other police work, or the routine work of the Prince's Yamen.

In practice only one or two officials attend in turn at the Jassak's Yamen to transact business. In case of necessity the Jassak calls a council of all his officials. In his yamen are settled criminal and civil judicial cases, the guiding book being a collection of former decisions of the Li Fan Yuan. Records are kept of affairs and expenditures, the clerks employed being known as Bichechi. The Mongol Princes and their hoshuns pay no actual taxes to the Peking Government, but are bound to supply personnel for the maintenance of postal or "urton" communications.



Lamas of Khalachin left Wing Moshun in the most Chinesefied part of Inner Mongolia. These Lamas remain quite Mongol, illustrating how Lamaism forms a bulwark against the loss of Mongol national characteristics.

We now pass to the detailed consideration of each of the six Inner Mongol Leagues.

The CHOSOTU League is divided into:

(1) Khalachin Aimak with its three hoshuns: Right wing hoshun, Centre hoshun and Left wing hoshun.

This Aimak entered the Manchu Empire about 1630; like the rest of the Inner Mongol Princes who submitted to the Manchu Emperor before 1635, the Khalachins did so in order to save themselves from the domination of Likdan (or Lindan) Khan of the Ch'ahars who aspired to weld together again at any rate all the Inner Mongols into one empire. The hope of sharing in the coming spoil of the Ming Empire, was also a strong incentive to joining the Manchus. The present head of this Aimak is the Prince Khalachin, who is head of the Bureau of Mongolian and Tibetan affairs at Peking.

(2) The Tumet Aimak, with a Left-wing hoshun and a Right-wing hoshun, entered the Manchu Empire in 1628-29.

The whole of Chosotu League is now included in Chihli Province, as also is part of the next League, Chou-uda. These two leagues go to form the Chinese administrative districts of Ch'eng te fu or Jehol and Ch'ao Yang Fu. The two leagues in question have their affairs supervised by the Jehol Tu't'ung or Military Governor, a post now filled by Hsiung Hsi Ling, former Finance Minister at Peking. He (as also the other Chinese officials who supervise the Inner Mongol Leagues) forms the official channel through which the Peking Government transacts all business with the League.

The population of the Chosotu League is partly Mongol, partly Chinese, but the latter now predominate. The Mongols, who here have become Chinesefied, and are all settled agriculturalists, dislike and are disliked by other Mongols (according to Russian sources). Chinese colonization has been going on for 200 years, but on a small scale till 1891. At first the Mongols were pleased at being able to let their land, but later unfriendliness arose and many Mongols retired into the hills. In 1891 massacres of Mongols took place by Chinese of the Chin Tan Tao Society, partly owing to mere racial ill feeling and partly to the refusal of Mongols to let more land. In 1892 these disorders were suppressed, but a large part of the surviving Mongols migrated to other leagues, especially to the vicinity of T'ao-Nan-Fu in Cherim League, where they have taken to agriculture and form an important section of the population.

CHOU - UDA - LEAGUE contains eight Aimaks or eleven hoshuns, the Jassaks of which, with one exception to be noted in its place, acknowledged Manchu sovereignty, between the years 1627 and 1636. In 1635 the before mentioned Likdan Khan of the Ch'ahars was finally overcome by the Manchus and those Inner Mongol Princes, who had not already joined the Manchus, in order to save themselves from Likdan, now began to do so one by one, either from mutual jealousies, or

the lure of sharing in the spoil of China, or merely to obtain the favor and protection of the increasingly powerful Manchu Emperor.

As stated under the preceding league, Chou-uda League is under the supervision of the Jehol Tu T'ung or Military Governor. The southern hoshuns of the league are more than half populated by Chinese who till all the better land.

To take the Aimaks separately:

Aokhan consists of one hoshun, and is thickly colonised by Chinese. The Mongols have adopted agriculture, and lost much of their racial distinctions.*

Naiman consists of one hoshun, and is half occupied by Chinese; some Mongols have adopted agriculture.

Bairin consists of two hoshuns, West (Barun) or Great Bairin, and East (Tzun) or Little Bairin. There are no Chinese colonists, but a few Mongol agriculturists. Part of the Mongols live in fixed dwellings.

Jarud consists of two hoshuns. In Tzun or East Jarud the Mongols have largely settled in fixed yurts with gardens. It is thickly colonised by Chinese. The Mongols are few and poor.

In Barun or West Jarud the Mongols are also poor and live partly in yurts and partly in Chinese houses. The south of the hoshun has been colonized by Chinese.

Aru-Khorchin contains one hoshun. Mongol population is comparatively thick and there are but few Chinese.

Onniut contains two hoshuns, Barun and Tzun Onniut. They are completely colonized by Chinese, and the Mongols are largely Chinesefied.

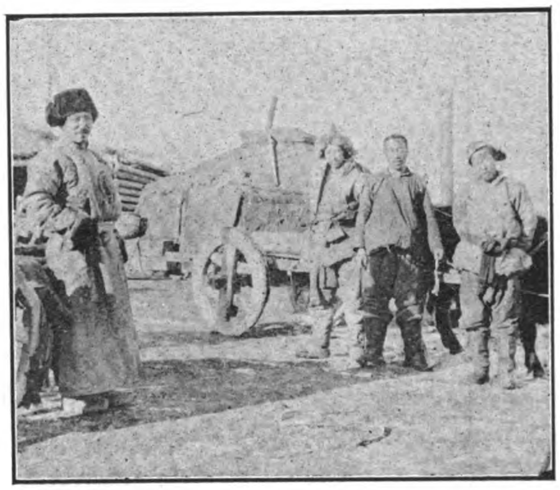
Kheshekten consists of one hoshun, and is chiefly notable as containing the city of Dolon Nor, a religious centre, artificially created by the Ta Ch'ings. The 15 living Buddhas own one fifth of the land in the hoshun. Lake Dalai Nor is on the boundary of this hoshun with that of Abaga.

Lastly Khalkha Left Wing—or Tsokhor Khalkha—consists of one small hoshun of one somon only. It is wholly colonized by Chinese. In 1664 the Jassak of this hoshun, then forming part of the Jasaktu Khan Aimak of Khalkha, revolted against his Khan, migrated with his following into Inner Mongolia and acknowledged Manchu sway.

CHERIM LEAGUE consists of four Aimaks, containing in all ten hoshuns. The Jassaks of these hoshuns were the earliest to acknowledge Manchu overlordship, the first doing so in 1617.

This league is now almost wholly affected by Chinese colonization, but in varying degree in the several hoshuns. In some, especially those in the south, colonization by Chinese began many decades ago and was and is on a basis of free contract for the purchase of the land. The Mongols here are partly or wholly Chinesefied. In other parts, such as those around T'ao Nan Fu town and on the Nonni colonization has only been started in the last two decades and has latterly taken the Government-assisted form, whereby lands are expropriated from the hoshuns and declared open for purchase and agricultural colonization, part of the profits of sale going to the Jassak of the hoshun in question. The north-western part of the league, close to the Khingan Mountains, is still untouched by agriculture and colonization. The newly formed administrative district (Fu) of Fengtien province, known as T'ao Nan Fu, is wholly in Cherim League, and here colonization has been vigorously pushed on in late years by the Chinese Government. Parts of the Chinese administrative districts of Hsin Min Fu, Ch'ang Tu Fu and Ch'ang Ch'un Fu are also formed out of Cherim League. Thus a large part of the League has been swallowed up in Fengtien Province. Similarly parts of the N. E. hoshuns have also been included in administrative units under Hei Lung Chiang province.

*Since writing the above, the Republican Government, following the precedent set by the Manchus, has decreed the formation of a second hoshun out of the AOKHAN AIMAK. Twelve somons have been set apart for this purpose and the jassakship of the new hoshun given to a sealless prince of the aimak.



Chinese Colonists between Kiakhta and Urga
Photo by Lieut. Binsteed

The affairs of this league are supervised by the Tutuh or Governor-General of Fengtien, (Mukden).

To examine the Aimaks of the League severally we find first the Khorchin Aimak, consisting of six hoshuns:

1.—Bo Wang hoshun—The first to join the Manchus in all Mongolia (1617). Four-fifths is colonized, and the Mongols in the Eastern part are Chinesefied. This is Prince Ahmerling Kui's hoshun.

2.—Darkhan Wang hoshun—The largest and perhaps richest in Cherim League. Unassisted colonization progresses slowly towards N. W. This hoshun contains six sealless princes besides the Jassak who is closely related to the Imperial Family by many marriage ties.

3.—Bintu Wang hoshun—In the south the land is all colonized and the Mongols Chinesefied. In the north, unsuitable for agriculture, it is owned by Mongols. The Jassak was the Bintu Wang who recently died in Urga.

4.—Tushé Kung hoshun forms part of T'ao Nan Fu district (see below).

5.—Jasaktu Wang hoshun forms part of T'ao Nan Fu district and contains T'ao Nan Fu town. The now well known Prince Wu t'ai, who was leader of the so-called T'ao Nan Fu Rebellion in the autumn of 1912, was Jassak of this hoshun. He has now been replaced by his uncle, a result of the Chinese repression of the rebellion.

6.—Tushetu Wang hoshun—Part goes to form T'ao Nan Fu district, while the N.W. end is untouched by colonization.

The following details about T'ao Nan Fu are interesting in view of the fact that the ultimate fate of this area is still doubtful, in spite of the rapid inrush of Chinese settlers. In the whole district (according to the Russian authority, Monsieur Boloban, writing in Jan., 1910) 4,696,000 shang have been expropriated and set apart for colonization. (N.B.—A shang is a strip of land 5' 2" wide by 1,410 ft. long, and 45 shang go to one square Li or Fang). About half of the above expropriated land is in Jasaktu Wang hoshun. Monsieur Boloban estimates that in 1910, 67,000 shang were actually ploughed. The Chinese population is variously estimated from 66,000 to 82,000. There are some 4,000 Mongol agriculturists (chiefly immigrated Khalachins) and about 19,000 nomad Mongols. This is the result of 20 years of Chinese efforts, since the district or Fu was formed in 1893, the first Chinese colonists having arrived there three years earlier. On the other hand, the intensified government-assisted colonization began only in 1902.

To pass to the other aimaks of Cherim League:

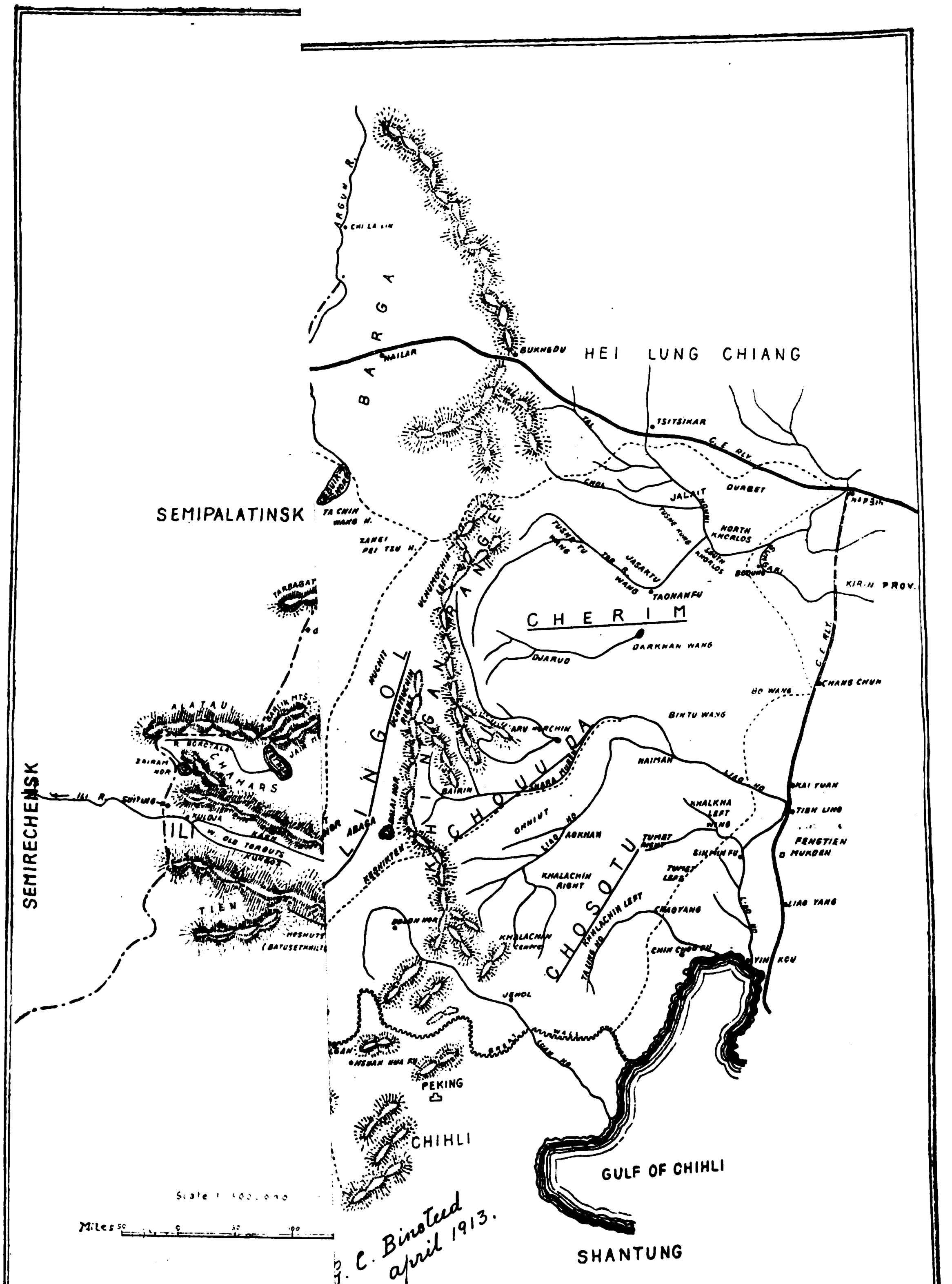
Ghorlos contains two hoshuns.

Tzun, also called North, Ghorlos, lies between the Sungari, Nonni and the Chinese Eastern Railway and reaches to Harbin. It is being quickly colonized by Chinese. Of late years the Jassak has pursued a somewhat anti-Mongol and anti-Lama policy and consequently incurred unpopularity.

In Barun, otherwise South, Ghorlos, Chinese settlers appeared over a century ago. It is one of the richest and most populous hoshuns in Cherim. It will soon be completely colonized and the Mongols themselves have become Chinesefied.

Durbet aimak consists of one hoshun, most of the settled land in which has been expropriated for colonization. As it contains five stations on the railway and the Tsitsikar-Bodune Road, its future is promising. The Mongol cattle rearers have not enough land left for their cattle and will be forced to migrate or turn themselves into labourers.

Jalait aimak is also of only one hoshun. Colonization has been slow owing to Mongol opposition. It contains



OUTLINE AND PHYSICAL FEATURES TAKEN FROM MATUSOVSKI'S MAP OF CHINA. AND FRENCH MAP OF ASIA BY VIVIENDE ST MARTIN AND FR. SCHRADER.

Mongol official showing Chinese rank button on hat, which continued to be worn even after the declaration of independence.
Photo by Lieut. Binsteed

the new Chinese town of Tatzu Ch'eng, and amongst the colonists are many Khalachin Mongols.

Next we come to SILINGOL LEAGUE, which contains five aimaks, each of two hoshuns. This is the only one of the four Eastern Inner Mongol Leagues which remains almost wholly unaffected by Chinese colonization. Though land in some hoshuns (Abaga and Abaganor) is suitable for agriculture, none is anywhere carried out. The affairs of this league are supervised by the Ch'ahar Tu T'ung or Military Governor (see again under Ch'ahar Mongols). In view of the fact that this league borders on Khalkha, that it is uncolonized by Chinese, and that the Urga Government is evidently bent upon winning its secession from China, it is of importance to note that in past history, aimaks of this league have on several occasions passed over into Khalkha and allied themselves with the Khalkha Khans. The chief landmarks in the history of these events are:

1625—The efforts of Likdan Khan of the Ch'ahars to subordinate all the Inner Mongol Princes under his own sway, causes the whole of the five aimaks, which later formed Silingol League, to migrate into Khalkha and place themselves under Tsetsen Khan.

1635—Likdan Khan having been overcome by the Manchus,

1637-39—the greater part of the above five aimaks return to their old lands in Inner Mongolia and accept Manchu suzerainty.

1646—Prince Tengis of Sunit is persuaded by the Khalkha Khans to repudiate Manchu suzerainty and recross over to Tsetsen Khan aimak. Tengis also pillages Bairin aimak. Tengis' wife was the Manchu Nurhachi's daughter.

1648—A Manchu force having defeated Tengis and recaptured his wife, Tengis finally submits and is reinstated as vassal.

1651-1666—The remaining hoshuns of the five aimaks of the present Silingol League one by one return from out of Tsetsen Khan aimak and accept Manchu suzerainty.

The five aimaks of this League are:

1.—Uchumuchin, consisting of Barun (West) and Tzun (East) Uchumuchin hoshuns.

2.—Huchit, consisting of Barun and Tzun Huchit hoshuns

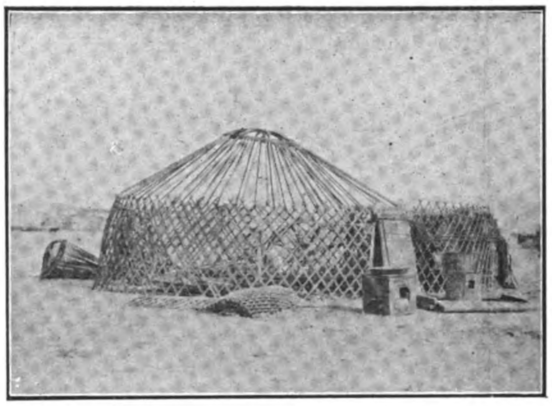
3.—Abaga, consisting of Barun and Tzun Abaga hoshuns.

4.—Abaganor, consisting of Barun and Tzun Abaganor hoshuns

N.B.—The hoshuns of Tzun Abaga and Tzun Abaganor nomadize on the same lands. Both the last two aimaks originally formed part of Khalkha, whence they migrated into Inner Mongolia and then in 1625, as stated above, back into Khalkha.

5.—Sunit, consisting of Barun and Tzun Sunit hoshuns.

ULANCH'AP LEAGUE consists of four aimaks or six hoshuns. They joined the Manchu Empire between 1627 and 1636, except the Khalkha Right Wing hoshun, which immigrated hither from Tushetu Khan aimak of Khalkha in 1653 and accepted Manchu suzerainty.



A Mongolian yurt without cover
Photo by Lieut. Binsteed

The affairs of the League are supervised by the Sui Yuan Ch'eng Chiang Chün or Military Governor (see under Kui Hua Ch'eng Tumets).

The four aimaks are:

(1) Durben Huhet or Ssŭ Tzu Pu Lo consisting of one hoshun;

(2) Mao Mingan, one hoshun;

(3) Orat with three hoshuns, Centre, Front and Rear;

(4) Khalkha Right Wing, one hoshun.

In 1912 the Peking Government was evidently very anxious as to the part these aimaks would play with reference to the secession of Khalkha. Their Princes appear, temporarily and outwardly at any rate, to have decided to remain under the control of Peking.

The IKH CHAO or ORDOS LEAGUE consists of one aimak, the Ordos aimak, which contains the seven Ordos hoshuns. In 1635 this aimak was under the dominion of Likdan Khan of the Ch'ahars, who in that year was overcome and killed by the Manchus. As a result, in 1636 the Ordos Princes tendered their allegiance to the Manchu Emperor.

The affairs of the League are now supervised by the Sui Yuan Ch'eng Chiang Chün or Military Governor (see under Kui Hua Ch'eng Tumets).

The seven hoshuns are distinguished by the name and rank of their respective Jassaks.

We have now finished with the six Inner Mongol Leagues and pass to the consideration of some other groups of Mongols also included in the popular expression of "Inner Mongolia." These are the Ch'ahars, the Kui Hua Ch'eng Tumets, the Alashan and the Etsingol Mongols. They are none of them included in any league.

The CH'AHAR MONGOLS were subjugated by the Manchus in 1635, as the outcome of the struggle of their chief Likdan Khan against the Manchus, for supremacy over the Inner Mongols. Unlike the other aimaks of Inner Mongolia who voluntarily joined the Manchus, and were left in the enjoyment of autonomy, the Ch'ahars, being conquered, were given a purely Manchu Banner organization without any prince of their own.

Their nomad lands are outside the Great Wall N. of Kalgan and in the N. E. reach to Dolon Nor and Dalai Nor.

They are divided administratively and militarily into eight Banners, which form two wings, Left or Eastern and Right or Western.

Type of married Mongol woman
Photo by Lieut. Binsteed

The central figure is Lieut. Binsteed, the others are Buriats, Mongols of Trans-Baikalia.

The affairs of the Banners are dealt with by the Ch'ahar Tu t'ung or Military Governor, while civil affairs were under the Chihli Tutu.

The Ch'ahar Tu t'ung (Military Governor) lives at Kalgan and controls Ch'ahar Mongols and supervises Silingol League.

KUI HUA CH'ENG TUMETS consist of a Right (West) and Left (East) wing, each of 30 somons. Their lands are to the north of Kui Hua Ch'eng (Kukuhoto) in Shansi. All the Banner affairs are under the Sui Yuan Ch'eng Chiang Chün (Military Governor). Legal and criminal matters are under the Taotai in Sui Yüan Ch'eng.

The Sui Yüan Ch'eng Chiang Chün (Military Governor) looks after the affairs of the Kukuhoto (Kui-hua-cheng) Tumets and supervises also Ulanchap League and Ikh Chao (Ordos) League. He has an assistant in the Kiu Hua Ch'eng Fu Tu T'ung.

In 1616 the Kukuhoto Tumets in order to save themselves from Likdan Khan of the Ch'ahars, placed themselves under the protection of the Tzar of Russia. As, however, the Russians could afford no material help, in 1633 the Kukuhoto Tumets, again in order to avoid the rule of Likdan Khan, acknowledged Manchu sovereignty. In 1636 the Manchus dethroned the Tumet Prince and turned the Tumets into Bannermen like the Ch'ahars. The pretext for this was the relations of the Tumets with Russia.

The ALASHAN MONGOLS form an aimak consisting of one hoshun. By origin they are Hoshuts, one of the main divisions of the Eleuths or Western Mongols (see appendix).

Their prince, a Ch'in Wang, resides at Ting Yuan Ying, known to the Mongols as Alasha. These Mongols joined the Manchu Empire in 1686, as the result of the killing of one of their princes, Ochirtu, by Galdan Khan, whose ambition it was to form a great Eleuth Empire, united under himself (the so-called Jungarian or Dzungarian empire). The Alashan Mongols, under the Ta Ch'ings were under the supervision of the Ning Hsia Chiang Chün or Military Governor, whose seat was at Ning Hsia on the borders of the Alashan lands. The Kansu Tutu apparently is now responsible.

The ETSINGOL OLD TORGUTS form an aimak of one hoshun under a Pei le. They live along the Etsingol River. They were formerly under the Ning Hsia Chiang Chün, but are now apparently supervised by the Tutu of Kansu.

The story of the foundation of this principality and its adherence to the Ta Ch'ing Empire is so interesting and illustrates so much of the history of the Eleuths or Western Mongols and their extraordinary migrations that it is worth narrating here in spite of the comparative unimportance of this aimak, which only contains some 500 people.

Early in the 17th century, Batur Hun Taiji, an Eleuth Prince, and father of Galdan Khan, began to try to unite all the Eleuth tribes into a single dominion under himself. Some of the Eleuth Princes were jealous and opposed him. To avoid Batur Hun Taiji's sway the Torgut tribe of the Eleuths in 1625 migrated en masse from Jungaria to the Volga, where they became known, and where some of them still remain, under the name of Kalmucks.

The majority of these Torguts returned to their former haunts and accepted Manchu sovereignty in 1771.

But while on the Volga at the end of the 17th century a certain Torgut Prince, Arabjur, made a pilgrimage to see the Dalai Lama in Tibet. On his return journey, he found the old enmity between the chief of his tribe, the Torguts, with the Khano f all the Eleuths, now Tsevan Rapadu, nsccessor of Galdan Khan, was again inna acute stage, and as his route lay through Jungaria, the empire formed by Galdan Khan, Arabjur was unable to rejoin his fellow Torguts on the Volga. So in 1705 he repaired to Peking, tendered homage to the Manchu Emperor, was granted a Manchu title and alloted lands for himself and his followers. His son and successor, about 1732, was allotted the present lands on the Etsingol and in 1783 the family received the title of Pei-le.

We now pass to OUTER MONGOLIA and first to KHALKHA. The Khalkhas in 1688 placed themselves under the protection of the Manchu Emperor in order to save themselves from Galdan Khan of the Eleuths or Jungars (strictly the Jungars are only a subtribe of the Eleuths, but loosely they are often spoken of as meaning all the Eleuths.) As in the case of Inner Mongolia the Khalkha Jassaks were confirmed in the power of ruling their own hoshuns and received Manchu titles. The Peking policy of weakening the power of the Mongol Princes has been applied also in Khalkha,

Ordinary Mongol types

Photo by Lieut. Binsteed

but its success has not developed as far as in the case of the Inner Mongols. Chinese colonization in Khalkha is only to be met with in the fertile valleys of the Tola, Iro, Hara Gol and Orkhon beteween Urga and Kiakhta, where it began in 1881. But Chinese merchants are to be found everywhere. The main landmarks in the history of the consolidation of Manchu power over Khalkha are:

1719—The Khalkhan Khans forbidden to deal direct with foreign powers (*i.e.* Russia), this right being handed over to the Urga Amban.

Later on, the number of hoshuns was increased and the judicial powers of Jassaks curtailed, and lamaism fostered.

In 1725 the three existing aimaks were increased to four by the formation of Sain Noin aimak out of the many Jassaksof Tushetu Khan aimak, who all traced their descent to Tumenkin, fourth son of Nunukhu, first Tushetu Khan. In 1727 the four aimaks were turned into four Leagues or Chigulgan. To this day they have continued to be known by their names as aimaks, but the Khans under Chinese administration had ceased to have any power as such. Though the four aimaks and the four leagues severally coincide in extent, each in its capacity as a League has a name different from that which it bears as an aimak. The League names are seldom used. Khalkha in all contains 86 hoshuns.

The Tushetu Khan aimak contains	20	hoshuns
Tsetsen Khan aimak „	23	„
Sain Noin aimak „	24	„
Jasaktu Khan aimak „	19	„

The hoshuns of Khalkha have no permanent designation, the hoshun being generally distinguished by the personal name of the present Jassak coupled with his rank as prince. Consequently a list of these hoshuns is of little use unless constantly kept up to date. Moreover the name by which the new Jassak would be styled was not announced till he was confirmed by Peking, and the obtaining of this confirmation has in the past been known to take up several years used in collecting money sufficient to satisfy the host of Chinese officials who must all be gratified before the imperial consent was allowed to be obtained. When rival claimants for the Jassakship existed, excuse was afforded for even longer delays. The diets of the Khalkha Leagues meet every three years. In general the remarks on the aimaks, Leagues and hoshuns of Inner Mongolia apply also to those of Outer Mongolia.

In Khalkha are also a great many Mongols who are outside any hoshun and who belong to the Urga Hutukhta and are known as Shabi. These Shabi were given at different times by princes to the Urga Hutukhta. They number about 100,000 in all and live amongst the various Khalkha hoshuns. At their head is the Shantzotba "treasurer" and his Yamen. Many of the monasteries which form the centres of the various Shabi localities, are important centres of population and trade.

Most of the hoshuns of Khalkha are very small and sparsely populated, a great many containing only one somon and being ruled by Jassaks who are only first class Taiji. Even if an accurate and up-to-date list of the names by which these 86 hoshuns are known at the present moment were available, such a list would only weary the reader. We will therefore give below only a very few of the more important hoshuns. The position of these are shown on the sketch map.

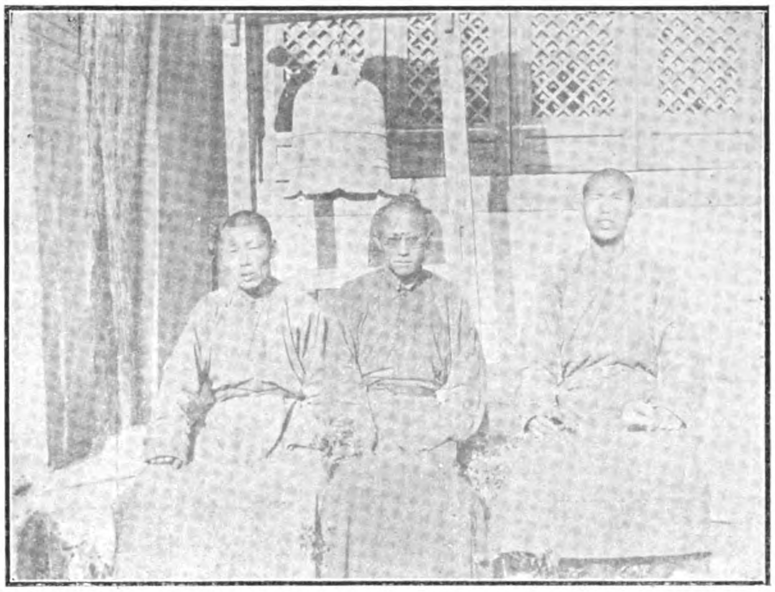
In Tushetu Khan aimak:

Tushetu Khan's own hoshun, of one somon;

Han Ta Ch'in Wang's hoshun of 7½ somons, a comparatively rich hoshun, the present ruler of which is the now well known Han Ta Dorji, Minister of Foreign Affairs in the Urga Government, and late special envoy to St. Petersburg.

Namsarai Kung hoshun on the Russian frontier near Kiakhta.

Mergen Wang hoshnn: of 14 somons, very extensive in territory and bordering with the Sunit aimak on Inner Mongolia.



Lamas of Jehol. These have been drawn from the Chosotu League. They all speak Chinese and some even do not speak Mongol.

In Tsetsen Khan aimak:

Tsetsen Khan's own hoshun of two somons;

San Pei tzu hoshun which contains the important centre of population and roads called Kerulen Urgo on the River Kerulen.

Tsetsen Pei le hoshun which lies across the Urga-Kalgan caravan route.

In Sain Noin aimak:

Sain Noin's hoshun, containing the important centre of Onghin Huré.

This aimak contains also the important Shabi centres of Zain-Gegen Huré (Lamasery) and Lamin-Gegen Huré. Prince Na-yen-t'u comes from Sain Noin aimak.

In Jasaktu Khan aimak:

Jasaktu Khan's own hoshun.

We now pass to the Kobdo and Altai districts of Outer Mongolia, which until 1907 were both included in Kobdo district.

The present KOBDO district, as far as concerns Chinese administration, is under the Kobdo amban, who, however, at present has been driven from his post by the Mongols. The district contains the following tribal agglomerations:

a.—The Sain Tzayagatu League of 16 hoshuns. Of these 14 are Durbets and two Hoits (both these tribes are Eleuths; see note on Eleuths.) The League is further divided into a left wing of 11 Durbet hoshuns and a right wing of three Durbet hoshuns and the two Hoit hoshuns.

Also the following small unimportant units:

b.—an aimak of Jahachins of one hoshun, originally a branch of the Jungars (also Eleuths).

c.—The Mingat aimak of one hoshun. The Mingats were originally an Urianhai tribe who after being for a while in Jasaktu Khan aimak were transferred hither in 1765. They have no Jassak.

d.—A hoshun of Eleuths known as the Eleuth hoshun, without a Jassak.

ALTAI DISTRICT was formed in 1907 from out of the Kobdo district and is under the Altai Chang Kuan or Altai Governor, now Prince P'alta, an Eleuth of the Torgut tribe. It contains:

1.—Two hoshuns of New Torguts known also as Bulgun New Torguts living on south slope of the Mongolian Altai. They form an aimak.

2.—One hoshun of New Hoshuts, the Habchak aimak of New Hoshuts, living on south slope of the Mongolian Altai.

The above two are both Eleuth tribes.

3.—Seven hoshuns of Altai Urianhai tribes.

4.—Military Agricultural Colonies near Buluntokhoi.

5.—Part of the Khirghiz or Ha Sa Ke who nomadize on the Altai, divided into 12 Otoks and having a peculiar organization and special titles for their leaders.

The last two are not Mongol tribes.

We next come to the lands of the TANNU-URIANHAI tribes N. of the Tannuola range. Of these people five

somons are under Jasaktu Khan aimak, 13 under Sain Noin aimak and three under the Urga Hutukhta. The remaining 26 somons were under the Uliasutai Chiang Ch'üng.

The latter 26 somons are divided into five administrations (like hoshuns), under special rulers called Ukheridi, who have powers as Jassaks but were elected and confirmed by the Uliasutai Chiang Chun. Each of these administrations is divided into somons as follows:

(1) Kosogol into 4 somons.
(2) Kemchik „ 10 „
(3) Tuchji (on R. Tersek) into 4 somons.
(4) Salchjik „ 4 „
(5) Tanun „ 4 „

Though the representatives of Chinese power have now abandoned Outer Mongolia, it will be best to give a brief description of what these officials were. The Peking Government still has its nominees to many of the posts, though the occupants have as yet been unable to go to the seats of their administration. Thus Prince Na Yen t'u is Uliasutai Chiang Chün, but remains in Peking. The Uliasutai Chiang Chün or Military Governor (Tartar General) is an office which was formed at the time of the so-called Jungarian wars in the 18th century waged between the Ta Ch'ing Empire and the Eleuth or Jungarian Empire founded by Batur Hun Taiji, Galdan Khan and their successors. At first the office was purely military. But after the subjugation of the Jungars, both the civil and military administration of all Outer Mongolia was vested in the Uliasutai Chiang Chün; but little by little, as the posts of the other Chinese representatives in Kobdo, Urga, and Altai were formed and developed, the importance of the Uliasutai post diminished until finally it only controlled the two Khalkha aimaks of Sain Noin and Jassaktu Khan and 26 of the somons of the Tannu Urianhai tribes (see under Tannu Urianhai). The Chiang Chün had an assistant, a Ts'an Tsan Ta Ch'en.

The Urga (K'ulun) amban, Pan Shih Ta Ch'en, with his assistant the K'ulun Pang Pan Ta Ch'en controlled the two aimaks of Tushetu Khan and Tsetsen Khan. At first this post was under Uliasutai, but afterwards became virtually independent. The Kobdo Amban, Ts'an Tsan Ta Ch'en controlled Kobdo district and, until 1907, what is now the Altai district then forming part of Kobdo. Since 1907 an Altai Pan Shih Ta Ch'en, now styled Chang Kuan, has ruled the Altai district with seat at Shara-sumé. The latter two governors had also become more or less independent of Uliasutai.

In Outer Mongolia there were four Tzarguchei (in Chinese Ssŭ Yüan or T'ung P'an) who looked after the Manchus and Chinese residing in Khalkha. Of these two were subordinate to Urga, one living at Urga and one at Kiakhta (Maimaich'eng). The other two were stationed at Kobdo and Uliasutai. The Tzarguchei heard all judicial cases in which Chinese were concerned. All Chinese had to obtain the permission of the Tzarguchei before settling in Outer Mongolia and before proceding to a new hoshun.

Having considered all the sections of Mongols which live in what is usually regarded as Mongolia, we come to those Mongols who live outside Mongolia, viz: The Kuku Nor Mongols; the Bargut Mongols, the Hsin Chiang Mongols and in the Russian Empire the Buriats who inhabit part of the Irkutsk and Transbaikal Provinces around the Southern end of Lake Baikal and lastly the Volga Kalmucks. These latter we shall not again mention, for although they are Mongols, we here concern ourselves only with the component parts of the late Ta Ch'ing Empire.

KUKU-NOR or Ch'ing-Hai was turned into a Chinese province by imperial edict in 1911. Its population consists of: (1) Kuku-Nor Mongols, (2) Tanguts or Hsi-Fan; (3) Dungans and (4) Chinese.

The Kuku-Nor Mongols are Eleuths, except one hoshun of Khalkhas, and were in the days of the Empire, under the supervision of the Hsi Ning Pan Shih Ta Ch'en (Amban) and now under that of the Kansu Tutu. The local administration is in the hands of the hereditary princes of the 29 hoshuns, which form a league, the diet of which meets on one of the Kuku Nor islands. The president of the League diet was not an elected Mongol Prince but was always the Hsining Amban or his delegate; in this the Kuku Nor League differed from all other Mongol Leagues.

The Kuku-Nor Mongols include: (1) Hoshuts—21 hoshuns; (2) Khalkhas—1 hoshun; (3) Choros or Jungars—2 hoshuns; (4) Hoits—1 hoshun; (5) Turguts—4 hoshuns.

The Tanguts include: (1) 40 tribes formerly under care of the Hsining Amban, governed each by a tribal chief or Tu Ssŭ; (2) 39 tribes who were subject to the Dalai Lama.

The Hsining Amban was senior representative of the Chinese authority in Kukunor.

Kukunor, at first an independent Tangut state, was conquered by the Hoshut Prince Gushi Khan towards the end of the Ming Dynasty period. Gushi Khan seceded from the rest of the Eleuths as a result of Batur Hun Taiji trying to subordinate all the Eleuths to himself.

1676 Gushi Khan's successor Ochirtu Khan was defeated and killed by Galdan Khan of the Eleuths.

1698 Some Kukunor Princes place themselves under the protection of the Ta Ch'ing Emperor K'ang Hsi when the latter was on his way to fight the Eleuths (Jungars). These princes were given Manchu titles and confirmed as rulers.

1723 Lubsan Dantsin, descendant of Gushi Khan, decides to unite Kukunor under himself and repudiate the Manchus. With a large following he revolts.

1724 The revolt is crushed. The Mongol population are divided into 29 hoshuns. The Tanguts are removed from the jurisdiction of the Mongol princes and organized independently.

Next we come to the Bargut Mongols living in BARGA. Owing to the peculiar interest attaching to Barga at the present time, in that it has seceded from the rest of Manchuria and placed itself under the Urga Hutukhta, its complicated organization will be treated in some detail. The following notes on it are almost exclusively taken from Colonel Baranoff's recent pamphlet on the subject.

Barga is the popular local name for the part of Heilung Chiang Province which lies west of the Khingan range. To the Chinese it is known as Kulunber, derived from the names of two lakes, Kulun or Dalai Nor, and Buir Nor. Its inhabitants are collectively known as Barguts and consist of Buriats, Eleuths and Chepchins, who are Mongols, and of Solons with some Orochons and Daurs who are Tungus tribes. The tribal organization is as follows:

Barga is divided into Shun or New Barga, containing eight hoshuns and Huchin or old Barga, containing nine hoshuns. The eight hoshuns of Shun Barga are all of Buriats, who about 1735 migrated hither from out of the Tsetsen Khan aimak of Khalkha. Huchin Barga contains six hoshuns of Solons, two hoshuns of Chepchins and one hoshun of Eleuths. The Solons and Chepchins were transported hither in 1732 from the Tsitsikar and Butkha districts of Heilungchiang Province for being troublesome, the Chepchins having earlier come from Khalkha to Tsitsikar. The Bargut Eleuths are descended from some of the soldiers of Galdan Tseren Khan of the Eleuths or Jungars, who were captured by the Manchus in 1732 and settled here.

All the hoshuns have three somons, except the Eleuth hoshun, which has only two. This latter hoshun stands in many ways apart from the organization of the remainder. Shun Barga is divided into two wings, called Right (Daskun) and Left (Tsevul). The eight hoshuns of Huchin Barga are similarly divided, four Solon hoshuns forming the Tsevul wing and two Solon and two Chepchin hoshuns the Daskun wing. Each of the four wings is under an Ugurda. Each pair of hoshuns is under a Golda (or Igilda). The hoshuns have no separate rulers. Each Somon is under a Tzangin. Under the Manchus the hoshuns were formed into the usual Banner Troops organization. Thus the eight hoshuns of Shun Barga and the eight hoshuns of Huchin Barga each formed a complete set of four plain and four bordered coloured banners. The odd Eleuth Banner was bordered yellow. The whole of the above tribes are nomadic.

The HSINCHIANG MONGOLS.

The Mongols of Hsinchiang are either Eleuths or Ch'ahars. The Eleuths consist of: (1) 10 hoshuns of Old Torguts who

(*Continued on page 70*)

THE RAILWAYS OF INDIA

There are several outstanding features in connection with the Railways of India which at once attract attention and court investigation. State ownership is a vexed question in many countries, but here it is exemplified on a large scale and appreciated as a public boon and a profitable business. All the Railways in India are practically owned by the Government, and in 1911 they produced surplus revenue; after paying all expenses and the interest on the capital invested, of 3½ million pounds sterling, while the expectation in this direction for 1912 reaches the round sum of five millions. Cheap travelling is a thing which every Britisher loves, and here in India there is the lowest charge per mile, of any country in the world. First class is 1.1d. per mile, 2nd class just half that amount and third class about .2d., or 6 miles a penny. Nearly 400 million passengers of all classes travel annually an average of 37 miles at the rate of just under 1/5th (one-fifth) of a penny per mile, while the average rate for goods of every description is a small fraction less than a half penny per mile per ton.

Another striking feature is the small capital outlay per mile. There is to-day a total length of 34,000 miles of route open and working, and the capital outlay is represented by £330,000,000 (three hundred and thirty million pounds) or less than £10,000 per route mile, fully equipped and stocked for working conditions, while in England 23,387 miles stand for a capital outlay, or rather a total paid up share capital of over 1,300 million pounds. The comparison is invidious, but the temptation to make it is strong. The average dividend earnings of all the Indian Railways for 1911 was 5.87% on the capital outlay.

These remarkable figures invite enquiry, and, having every facility for investigation placed at my disposal I turned them to account, and now propose briefly to touch on the main factors which produce such gratifying results, viz:

The conditions under which railways are built.

The system of control.

Actual conditions of working.

Railway construction was first undertaken in India in 1850, when the Great Indian Peninsula Railway Co. commenced a line from Bombay inland. The Government guaranteed 5% on the capital outlay. The capital had to be raised by the Company, and any surplus profits over the guaranteed 5% was to be shared equally between the Company and the Government. Soon afterwards a number of smaller lines were constructed by other companies under similar conditions. In all these contracts the Government reserved the right to purchase the lines at the end of 25 or 50 years, and in every case this right was exercised. In this way the Government became possessed of all the main railways, including the Great Indian Peninsula, the Bombay, Baroda and Central India, the Madras, the East Indian, Eastern Bengal, and some others.

About 1870 the State undertook the building of Railways on its own account.

Difficulties, however, arose in connection with the State finding sufficient capital to carry out an extensive programme of State Railway construction. The power of the Secretary of State and the Government of India to raise all the money required by State loans reached its limit and obliged Government to revert again about 1880 to the use of Cos. as a means for raising additional capital from a different class of investors to those to whom Government loans only appealed.

There was, however, a great difference between the position of these new Cos. and the Cos. who constructed the original Railways of India. The latter supplied all the capital required under a 5% guarantee. The former supply only a small proportion of the capital required, the balance being supplied by Government.

In respect to the working of lines, the principle now adopted is for the State to work directly some of its lines, the rest being leased to Cos. to work for the State.

To give a Co. an interest in this lease the proportion of the capital is held by the Co., and carries with it the right to a share of surplus profits after certain fixed charges have been met.

This proportion varies with different Railways and is as low as 1/20 in one case.

Briefly the position is this :

New construction is carried out both by the State and by Cos. on behalf of Government. Lines are worked both by the State and by the Cos. on behalf of the State, each Co. having an interest in the working and the whole of the lines of India are constructed and worked under the control of Government as exercised by the Railway Board whether they are State or leased to Cos.

To develop the construction of feeder and Branch lines Government offers very substantial financial assistance with the object of inducing Indian capital to invest in Railway development; in 1910 these terms were considerably improved and have been very successful in securing their object.

The main features of the Branch line terms are:—

The Prospectus of the Company must be approved by the Government.

Subscriptions towards the capital of the Company must be invited *only* in India.

All plans, proposals and estimates for expenditure must be approved by the Railway Board on behalf of the Government.

All land required is provided free by the Government.

The financial assistance offered is either a 3½% guarantee or a rebate on interchanged traffic sufficient to pay 5%, surplus profits being divided in both cases.

The Government reserve the right of fixing maximum and minimum rates.

The Government have the option of purchase in 30 years on terms varying between 100% and 120% of the capital outlay.

To the part taken by Government in Railway control is due the lack of destructive competition. There is a healthy rivalry between railways in the same state or locality, but nothing approaching reckless competition. It is usually thought that keen competition makes and keeps the cost to the user low, but there is an entire absence of that quantity in India, and yet it has by far the cheapest railway travelling in the world. These are points the deductions from which must be left to the students of Railway Economics.

The control of the Railways is vested by the Government in the Railway Board, which consists of three members—one being President. This Board has at its disposal annually a sum of about ten to twelve millions pounds sterling which it allocates among the different companies for open line improvements and new construction work. It also has to approve all fresh expenditure proposed by the Companies on their own account. In the case of a new Company undertaking a new line all expenditure is subject to the control of the Railway Board. Each Company has a separate Board of Directors whose head-quarters is in London. The Indian Government have a Director of Railways whose office also is in London. He is ex-officio Member of the Board of each Company, in an advisory capacity, and he attends all Board meetings. The Board of Directors of each Company is represented in India by an Agent who is the Executive Head to whom Departmental Heads are responsible and who is in turn responsible to the Board.

The Railway Board came into existence in 1905. Its principal officers are a Chief Engineer, an Accountant General and a Secretary. There are six Senior Government Inspectors, each of whom has one or more juniors and a clerical staff. Formerly the Railways were controlled by a Secretary, three Deputy Secretaries, three Under Secretaries and six Government Consulting Engineers were ex-officio Secretaries to the Local Government in whichever Province they were placed. Indeed the control of the railways was largely in their hands, and the difficulties which arose under this complicated system of control led mainly to the creation of the Railway Board.

The Board has large powers, and although it is under a Diplomatic Head—the Member of Council for Industries, Commerce and Railways, it comes as near being an independent unit as it is possible for anybody exercising delegated power and handling public funds to be. It was the conception of Lord Curzon, who aimed at placing Railways outside the sphere of other contending interests, personal or otherwise. Even the question of possible disagreement among the three Members of the Board is anticipated by its constitution. In such an event the individual decision of the President is final. Although the two members, if they both disagree with him, may represent their views to the Government in writing, the course decided on by the President is not thereby interfered with meanwhile. Thus the heading up of authority is completed, as in cases of necessity, the President is virtually a Dictator. This has much to commend it. Government machinery moves slowly especially in India and by the time the two dissenting members have succeeded in attracting any appreciable attention the action of the President will be beyond recall and something done. This was a recommendation of the Mackay Commission, which further advised that no recommendation of the Railway Board should be over-ruled without the matter being brought to the notice of the Governor-General.

Actual working conditions remain to be discussed. It has been said that the length of route now open is 34,000 miles; this takes no notice of double tracks, sidings, etc. India has thus more railways than any other British possession, and is fourth on the world's list—United States coming first, Russia second, and Germany third, with only some 3,000 miles more than India. This system of railways is worked by about a dozen companies, and for this purpose represents so many units, but being controlled by the Government, as already indicated, it becomes in this aspect one concern, under one Board, and that Board having a President vested with authority as nearly final as is possible to-day. It is not easy to judge how far this condition of dual control influences the results in dividends and cheap railway accommodation. But it does contribute largely to smooth working, and, where returns are satisfactory, this is a desirable thing. Further, it stimulates a laudable emulation among the various Managers and Boards, and makes comparison of returns possible on a reliable because a common basis.

Perhaps the strongest feature in the distinctive conditions of working is that of long distances across densely populated areas. An average of 37 miles per passenger travelling is very high, but when this is maintained year after year by close on 400 million people it may safely be concluded that herein lies one, and perhaps the chief, secret of the average fare for all classes being so low as one penny for 5 miles. Incidentally it may also be said that the free grants of land are to be credited largely with the comparative smallness of capital outlay and the consequent ease of maintaining satisfactory dividends.

In the matter of labour, supervision is on much the same lines as obtain in other countries, but the bulk of the employés and the conditions under which they work are somewhat destructive. Speaking generally labour in India is cheap if reckoned at per hand employed, but if valued by the actual result in effective work there is but little if any saving under this head. Railways have, however, a distinct advantage inasmuch as it is impossible to have three men doing the work of one where there is only standing room for one. This is exemplified, for instance, on the foot plate of our engine or in a signal cabin. There is not an army of porters on every platform as the passenger must have his luggage put in and out of the carriage by his own coolies.—*The Engineer.*

U.S. RAILWAY BUSINESS FOR MARCH.

For the month of March the operating income per mile of line decreased 31.3 per cent. for the railways of the East, increased 6.6 per cent. for the railways of the south and increased 9.4 per cent. for the railways of the west as compared with March, 1912. The average for the railways of the entire country decreased 9.9 per cent.

This operating income for the 222,086 miles of line summarized by the Bureau of Railway Economics from the reports of the railways to the Interstate Commerce Commission aggregated for the month $52,137,897, or $ 235 per mile of line, which is equivalent to $7.57 per mile of line per day. Operating income is that proportion of their receipts which remains available to the railways for rentals, interest on bonds, appropriations for betterments, improvements, new construction and for dividends.

The aggregate of the total operating revenues for the month was $241,048,818, an increase of $9,864,272 over March, 1912. The operating expenses were $178,234,167, or $14,104,236 more than for March, 1912. The net operating revenue was $62,814,651, or $4,239,964 less than for March, 1912. Taxes were $10,418,258, an increase of 7.7 per cent. per mile of line over March, 1912, leaving the operating income 9.9 per cent. less per mile of line as stated.

AN OIL FIELD IN BURMA

Sir Herbert Thirkell White, late Lieut.-Governor of Burma, presided at a meeting of the India section of the Royal Society of Arts when Mr. N. G. Cholmeley, C.S.I., late Commissioner of the Magwe Division of Burma, read a paper on the Burma oilfields. There was a large attendance.

After referring to the ignorance of the general public of the fact that the Province of Burma was a very considerable producer of petroleum, Mr. Cholmeley said the Burma oilfield was producing its modest output of oil long before 1859, when Colonel Drake first struck oil in America. The Burma oilfield was not among the great oilfields of the world. Its annual output of 220 million gallons or so was a mere drop in the ocean of the world's production. It enjoyed, however, the distinction at present of being the biggest producer within the British Empire, and if the saying credited to the inventor of the Diesel oil engine—that "for power-generating purposes oil will entirely displace solid substances before many years are past"—ever comes true, the importance of an oilfield of our own, more especially for Admiralty purposes, could hardly be over estimated.

Two Distinct Fields

There were in Burma, as a matter of fact, two quite distinct oilfields which were in process of being worked, for besides the main field in Upper Burma, there was a small field near the Aracan coast, on the islands of Ramree and Cheduba, but the output from that region per annum was only about 55,000 gallons. There appeared to be little probability of an enhanced production from this field, which seemed to be of no commercial importance.

The Burma oilfield proper was situated in four sections on opposite sides of the Irrawaddy about midway between Rangoon and Mandalay. The most important part of the field was on the east side, being divided into the Yenangyaung field, 26 miles above Minhu, and that at Singu, about 20 miles higher up The relative importance of these sections might be gauged by their respective outputs, which in 1911 were as follow:—

	Gallons.
Yenangyaung	166,494,000
Singu	50,576,000
Yenangyat	4,476,000
Minhu	632,000
Total	221,546,000

The total production was about 5 per cent. ahead of the previous year.

An Ancient Industry

After referring to local stories of the first discovery of oil, the lecturer described the old fashioned methods of digging wells in Burma previous to the advent of the oil companies. In 1797 Captain Hiram Cox estimated the production of the native wells at 92,781 tons valued at 889,737 Sicca rupees annually, but those figures were based on information that was certainly incorrect, and they were no doubt greatly exaggerated. In 1826 Crawford reckoned the annual output at about 34,380 tons, value about £82,500, the average daily output being about 830 lbs. per well. In 1858 Captain F. Yule referred to the export trade. He said:—

"There is now a considerable export trade of the article from Rangoon to England, and one of the Rangoon houses has a European agent residing on the spot. The demand in England is, I believe, for use to some extent as a lubricating oil, but it is also employed by Price's Company, at Lambeth, in the manufacture of patent candles. It has sold in the London markets at from £40 to £45 a ton. The ordinary price of the article in Burma used to be about 16s. the ton." Some modern oil companies must sigh for the good old days, when crude oil could be bought at the wells for 16s. a ton and sold in London for £45.

The New Era

It was not until the annexation of Upper Burma, in 1885, that a change was made in the method of working. In 1880 the total production was probably about 2,500,000 gallons; by 1890 the production had risen to over 4,000,000 gallons; in 1900 it was close on 38,000,000, and in 1910 211,500,000 gallons were produced with an export of over 106,000,000 gallons, besides some 5,000,000 lb. of paraffin-wax and candles. This enormous increase was due to the appearance on the field of Western capital and Western methods of working. In 1887 the Burma Oil Company, having acquired by a lease from Government the blocks of land adjoining the native reserves, put down their first drilled well, and the new era began.

Mr. Cholmeley then described the Minhu field, where the production had risen from 18,320 gallons in 1910 to a monthly production, from about 80 wells, in 1912, to some 300,000 gallons. At Yenangyang the Burma Oil Company were the pioneers. The field was divided into the leased blocks, which were let by the Government to the company in the early days after the annexation of Upper Burma, before any other companies appeared in the field, and the reserves of Twingon and Bemo, which were set aside by Government for the hereditary oil miners, or Twinzayos. With the exception of the parts of the Burma Oil Company's leased blocks, known as the Khodaung, or Nine Hills, the reserves contained the richest part of the oilfield, and that company for many years pursued unchallenged a policy of purchasing well sites from the Twinzayos, and sinking wells on them.

Rise in Land Values

Before 1902 these sites could be purchased for sums varying from 20 to 100 rupees. From that time on the threatened competition of other companies drove the price up. In 1906 the Rangoon Oil Company appeared on the scene, and began leasing well sites from the Twinzayos, on the terms of payment of royalty of eight annas for every barrel of crude oil won. The success of this scheme soon brought a host of other competitors into the field, and by the end of the year the price of the best well sites had risen to 5,000 rupees; in 1907 it rose to 10,000 rupees; in June, 1908, to 30,000 rupees; and by the end of that year as much as Rs. 60,000 (£4,000) was paid for a well site in the best part of the field. This, of course, was a "boom" value; the present price was from Rs. 7,000 to Rs. 10,000.

There were now six companies at work on the field, with an issued capital of close on £6,000,000, and as none except the Burma Oil Company has as yet obtained any considerable supply outside the Twinzayos reserve, it might be imagined how keen was the competition

PROPOSED SIBERIAN COPPER AMALGAMATION

The rumours lately current that an amalgamation of the Siberian copper mining companies, the Spassky and the Atbasar, was contemplated, were confirmed in a circular issued recently to the shareholders of both concerns.

Since 1911 the properties, which are distant from each other about 300 miles, have been under the same management, and at present the Spassky owns two-fifths of the Atbasar Company's capital, so that the companies are already closely allied.

The directors now propose that the Atbasar Company should be wound up and that the whole of the assets should be acquired by the Spassky Company on the basis of one Spassky share for every two Atbasar shares now held. This will necessitate the creation of 150,000 new Spassky shares, there being 300,000 Atbasar shares at present held outside the Spassky Company. The 150,000 shares thus issued will not be entitled to participate in any dividend distributed in respect of profits earned during the year ending September 30 next.

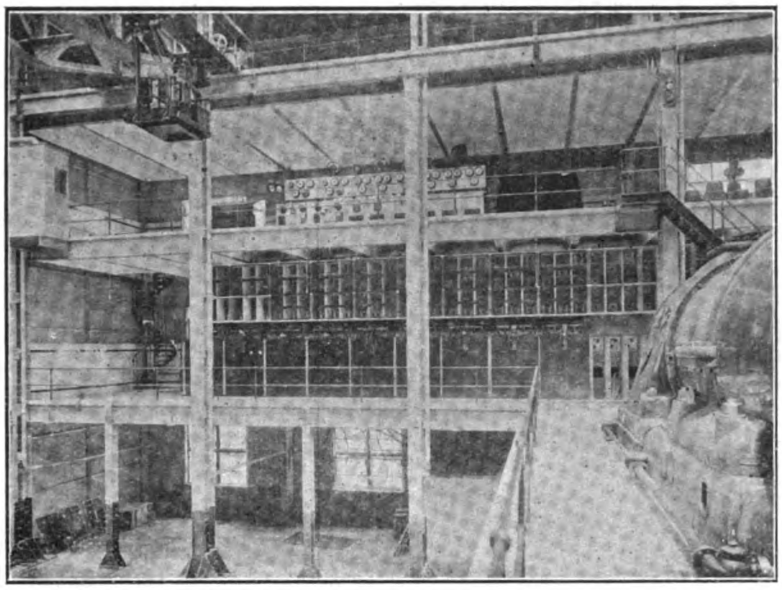
It is proposed to increase the capital of the Spassky Company to £1,250,000 by the creation of a further 650,000 shares. Of these 150,000 would be issued as already described, and 250,000 would be offered to the shareholders at par in the proportion of one for every three shares held in the amalgamated company. The remaining 250,000 shares would be held in reserve.

The Atbasar Company's engineers estimate that on June 30 last a tonnage of 517,909, averaging 10.25 per cent. copper, had been proved on the Atbasar property. The recoverable contents of metallic copper in this proved area would be 38,000 tons, of an approximate value of £3,230,000 (taking the average price in Russia over the last five years of £85 per ton) and an approximate net value of £1,400,000. Plans for the erection of smelters capable of producing 5,000 tons of copper per annum have been prepared, and these smelters are expected to be in operation the year after next. It is proposed to construct a narrow gauge railway between the copper mines and the smelters, and the survey has been completed and material is being ordered. It is hoped that the railway will be in operation over nearly the whole distance during 1914. At the present time the Spassky Mine is producing over 400 tons of copper a month and yielding a profit on that rate of production of between £200,000 and £300,000 per annum, according to the price of copper. The coal mine at Karagandy, belonging to the same company, is estimated to contain upwards of 400,000,000 tons of coal. A railway has been constructed from the colliery to the smelters.

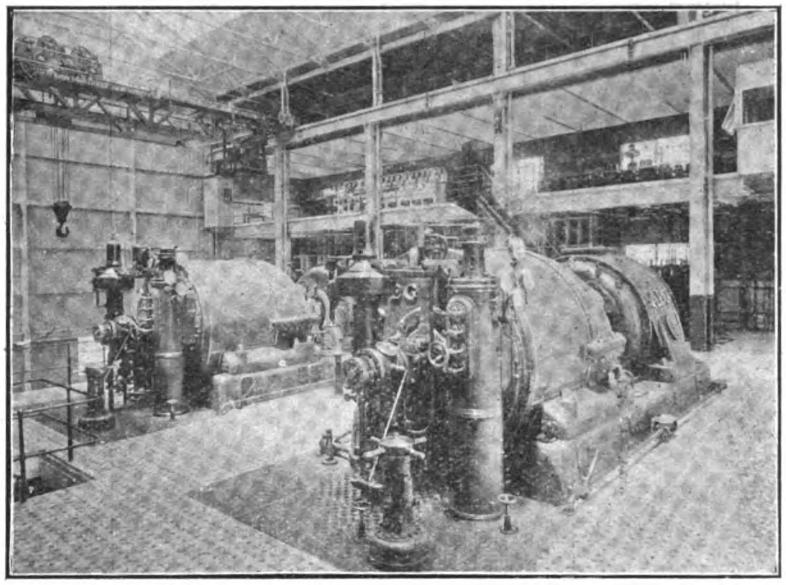
SHANGHAI MUNICIPAL ELECTRICAL DEPARTMENT

THE RIVERSIDE POWER STATION

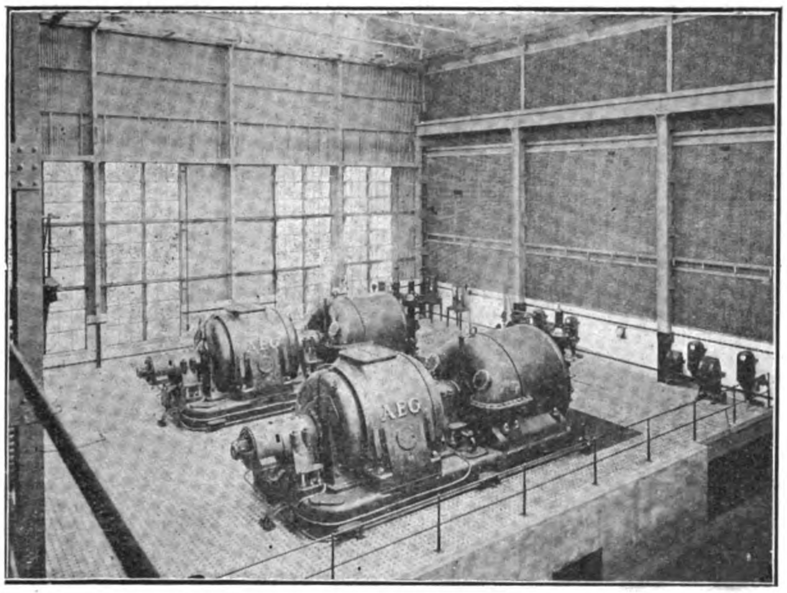
(A description of the Power Station was given in our April issue)



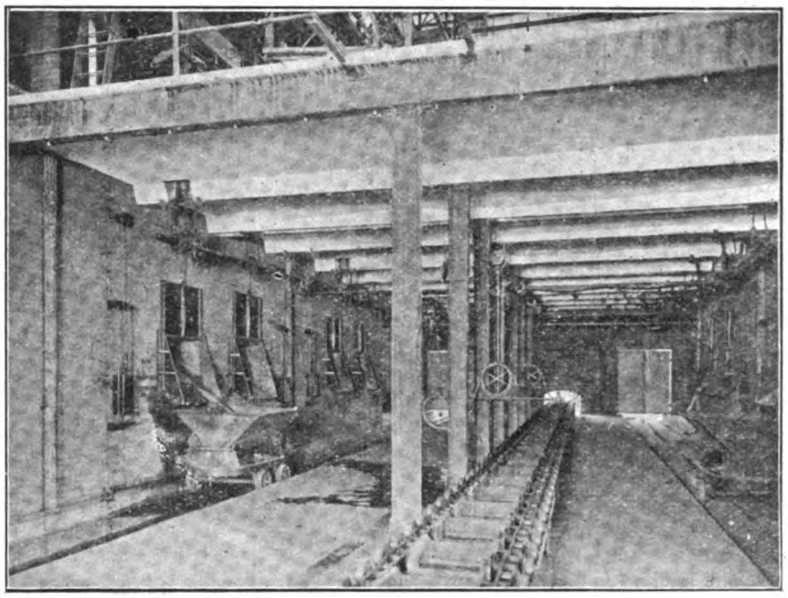
Extra high tension switch and bus bar cubicles



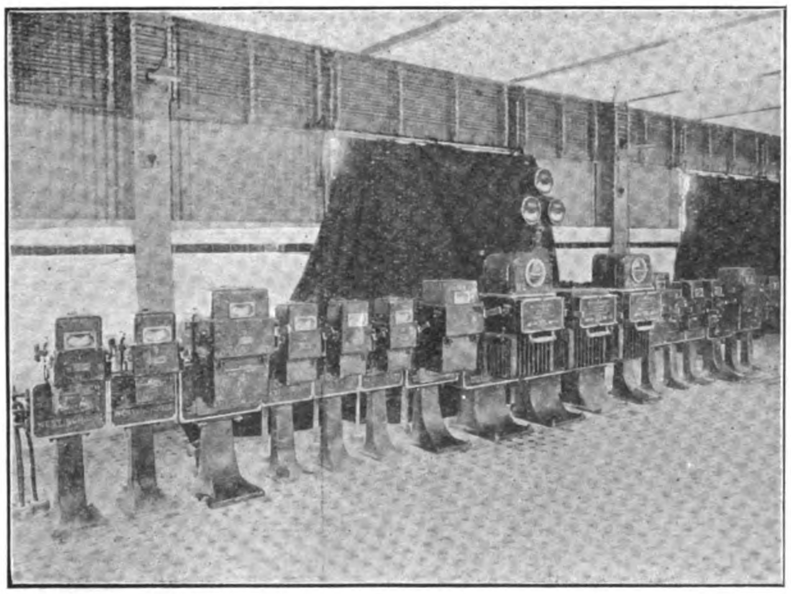
Two 2,000 K. W. sets



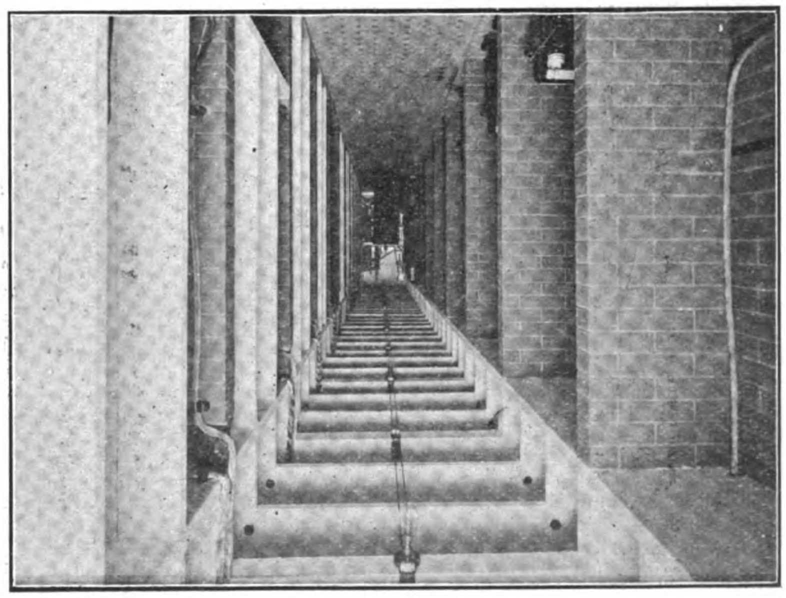
Another aspect of the two 2,000 K. W. sets



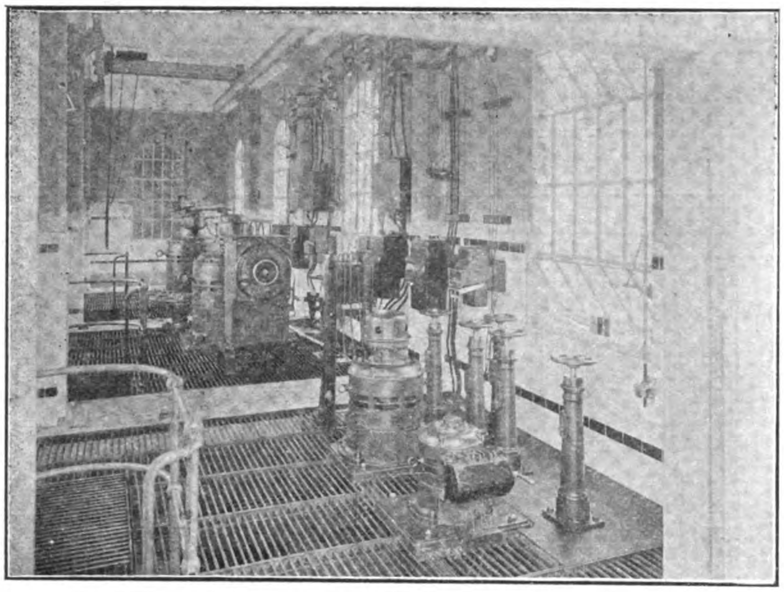
Ash Conveyer under boilers



Low Tension Power Board



View of the switch cubicles



SHANGHAI'S NEW POWER STATION.—Electrically driven centrifugal pump

SUBMARINE SHIP CLEANER COMPANY

A demonstration of a most striking and novel character was given at Southampton some time ago by the London representative of the Torpedo Submarine Ship Cleaner Company. This is an Australian Company which has acquired the patent rights of a machine designed to clean the hulls of ships below water line without the necessity of dry-docking.

The plant is carried on a flat-bottomed boat, 30 feet long by 13 feet beam. In the after end is an engine room containing a petrol electric generating set, a four cylinder engine direct coupled to the dynamo, propeller motor and switch and distribution board. Amidships is an electric winch of a special type fitted with four barrels, two for the suspension ropes, one for the electric cable supplying current to the brush motor, and one for raising and lowering the jib. The power is obtained from a compound reversing motor.

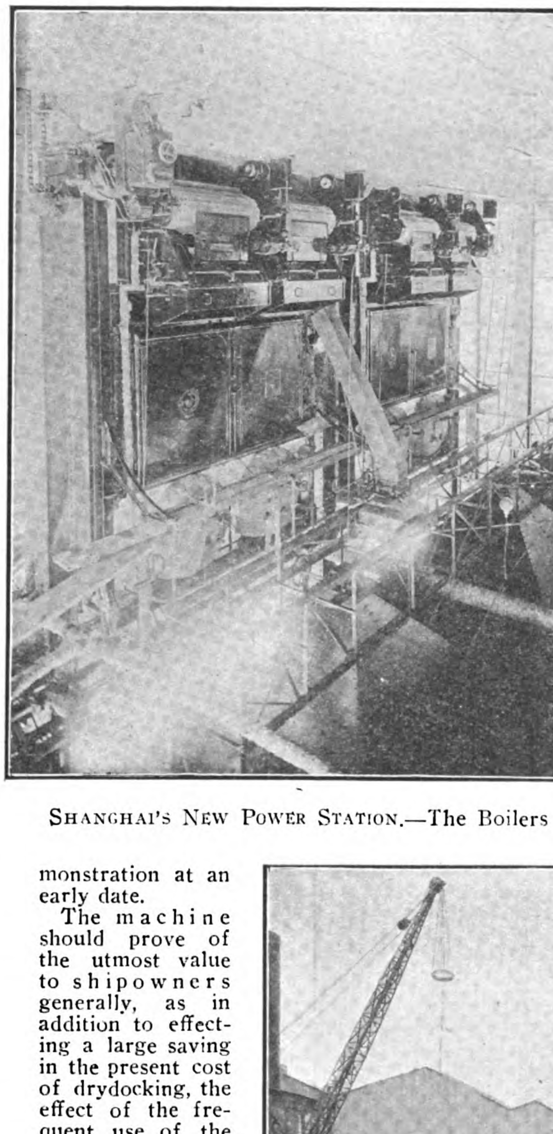
The actual cleaning gear consists of a framework carrying a revolving fibre brush (5 feet long) in front, and a propeller behind. Between these is an electric motor which drives both the brush and the propeller. As this portion of the apparatus works under water, the motor and gearing are enclosed in a water tight casing. The brushing apparatus is suspended by four steel ropes, which pass through the end of the jib to the winch.

The method of cleaning is as follows:—The barge is moored alongside the vessel to be cleaned. The jib from which the cleaning apparatus in suspended is lowered until in contract with the vessel's side. The brush is then set in motion and lowered away to the required depth which is indicated by a dial on the winch. It is then hauled up again, the brush meanwhile revolving continuously. The cleaning boat is then moved forward about 4 feet and the operation repeated. The particular method of suspension from the end of the adjustable jib, with the aid of the propeller drive, keeps the brush firmly pressed against the vessel's side, and enables the hull to be cleaned even under a sharply sloping counter. The machine works rapidly and, judging from the result of this demonstration, most effectively.

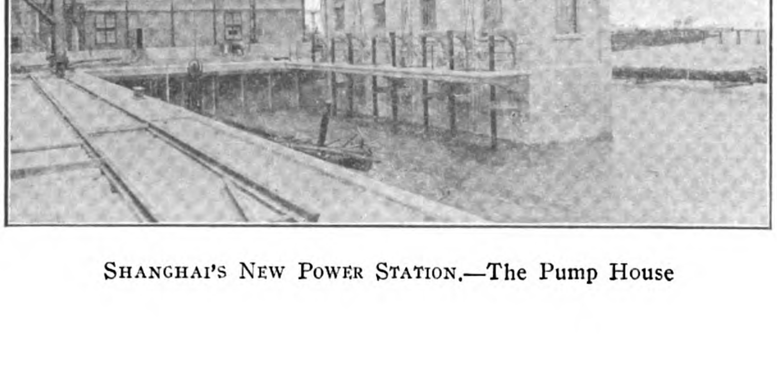
The vessed operated on was the R.M.S.P. s.s. *Thames*, and the weather conditions prevailing were such as to render a successful test of the efficiency of the machine very convincing. The *Thames*, which is one of the regular liners running to the West Indies, and which had not been dry docked since July last year, was berthed at an open berth, and the machine in working was hampered by a strong wind blowing across the Southampton Water. The major portion of the port side of the vessel was cleaned by the machine. When, subsequently, the *Thames* was drydocked an examination showed that the work done was of a remarkably satisfactory nature: those portions of the hull not operated on were covered with a thick accumulation of marine growths, whilst the parts operated on by the machine were absolutely clean.

It is stated that a vessel of 8,000 tons can be cleaned in from 6 to 7 hours. The demonstration given was of a semi private nature, and was witnessed by experts from the Admiralty and one or two shipping newspaper representatives. We believe it is the intention of the representatives of the company to give a further and more public demonstration at an early date.

The machine should prove of the utmost value to shipowners generally, as in addition to effecting a large saving in the present cost of drydocking, the effect of the frequent use of the machine would be to keep vessels always clean, thereby reducing friction with a consequent very considerable reduction in coal consumption. Further, as the machine can be worked while the vessel is loading or discharging a considerable saving of time is also effected.



SHANGHAI'S NEW POWER STATION.—The Boilers



SHANGHAI'S NEW POWER STATION.—The Pump House

PHILIPPINE TRADE.

Exports from the Philippine Islands in May show a falling off of P1,874,418 from the figures for the corresponding period last year. The figures for last May are P5,056,196 against P7,830,674 for May, 1912. This shrinkage of exports is chiefly in copra. During last May only 3,028,474 kilos went out compared with P15,337,912 in May of the previous year. The difference in value is P668,670 last May against P2,976,856 for May 1912. Hemp exports were in May less than during the same period last year by over 3,000,000 kilos, the figures being 6,461,058 against 6,773,404. The higher price now prevailing, however, more than offset the decrease in output. The value of May's hemp exports totals P12,554,514 compared with P2,337,966 for May last year, showing an excess of P216,548.

Sugar exports, on the other hand while showing an increase of over 2,000,000 kilos yielded P94,966 in May, the figures being for May 13,944,593 kilos valued at P12,151,228 against 11,799,331 kilos valued at P1,246,134 for May, 1912.

Cigars show an increase of over 2,000,000 in number exported and P22,024 in value received. The figures for May are 18,448,000 valued at P570,010 against 16,346,000 valued at P547,996 exported in May, 1912. Cigarettes increased from 3,306,000 valued at P5,974 in May, 1912, to 3,532,000 valued at P6,222 in May 1913. May's figures for all other tobacco show an increase in quantity exported from 889,617 kilos valued at P229,268 to 945,709 kilos valued at P290,424, value less by nearly P9,000.

The number of hats exported in May was only 51,321 against 79,695 in May last year. In value, however, the figures show an increase from P42,528 to P59,194. All other exports of domestic products show an increase from P373,956 to P552,374. The total figures for May were increased by exports of foreign merchandise to the value of P103,550, an item which does not appear in the column for May, 1912.

There are indications that more interest will be taken in the preservation of historic machines than in the past, and it can hardly come too soon, states the *American Machinist*. Machines which really mark epochs in machine design and development should be kept, not only as a monument to the man, but as an example in design. And lest some important machines be overlooked, our contemporary suggests that those interested begin making a list of such machines as should be saved. Such a list, giving the names, location and a brief history of the machines in any locality will be of great value when the time comes to select machines for the Mechanical Hall of Fame. And any who know of machines which deserve a place therein may be able to assist when the time comes, by jotting down a list from time to time.

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THE RISING AGAINST YUAN SHIH-KAI

In the June issue of the FAR EASTERN REVIEW we recorded the removal from office of the Tutuhs of Kiangsi and Kwantung, and stated that Poh Wen-wei, the Tutuh of Anhui, was also likely to be relieved of his duties. The dismissal of Poh duly took place, but contrary to expectation no resistance was offered.

As a result of a telegram sent by Chen Ting-chun, the officer in command of the Kiukiang forts, to Li Yuan-hung, in which he stated that he feared a mutiny, northern troops under the command of General Li Shun were sent on July 6 to the vicinity of Kiukiang. The Chamber of Commerce at Kiukiang and General O Yang-wu wired to Vice-president Li Yuan-hung asking that these troops should be withdrawn. It is stated that Li Yuan-hung ordered their withdrawal, but that General Li Shun declined to obey the order. Fighting with Kiangsi troops started on July 12 and communication with Kuling was for a brief period cut off.

On July 15 General Huang Hsing went to Nanking from Shanghai. The Tutuh, Chen Teh-chuan, was compelled to issue a proclamation in the following terms:—

"Whereas the forced entry of Northern troops into Teh-an (a town in Kiangsi) has caused the spread of rumours, thereby creating a panic among the people, I, the Tutuh, in order to preserve the peace of this province and in compliance with the wishes of the army, hereby declare the independence of Kiangsu and appoint Huang Hsing Commander-in-Chief of the Kiangsu punitive expedition against Yuan. The military and the people are hereby warned not to believe in rumours and disturb the peace, otherwise they shall be punished by martial law."

Three military officers who remained loyal to the Government were killed, but the troops generally threw in their lot with the rebels. Two days later the Tutuh and the Civil Government, Ying Teh-hung, left for Shanghai.

The Kuomingtang (Nationalist party) papers on July 17 published reports that Tsen Chun-hsuan, formerly acting Viceroy of Kwangtung, had accepted the position of Generalissimo of the "Army to Punish Yuan," as the rebel forces styled themselves.

General Huang Hsing on July 17 telegraphed the following manifesto to the Parliament at Peking, Vice-President Li, the Tutuhs and Civil Governors of all the Provinces, the various Provincial Assemblies, the Army and Naval officers, and newspapers in general:—

"The Northern troops have again assumed an aggressive attitude, and recently occupied the Arsenal at Shanghai. Upon hearing of this you were no doubt surprised. But following the murder of Sung Chao-jen and the conclusion of the loan in secret, these recent actions have removed the last doubt as to Yuan Shih-kai's treachery. That the citizens should be indignant at this is only natural. At the time these things occurred I was angry and wired to Peking, remonstrating with the Government. The Tutuhs of Kiangsi, Hunan, Anhui and Kwangtung also protested, as they were moved by the spirit of patriotism, but Yuan Shih-kai did not like this spirit and began to make preparations for war with the South.

At the time the crimes and motives of Yuan Shih-kai were manifest, but because of the trouble on the frontiers we did not care to take action and thus bring about internal strife. Therefore, although Yuan Shih-kai answered my telegram in haughty terms, I kept quiet. The four Tutuhs were, however, dismissed and they left their positions without a murmur, so that it cannot be said that they disobeyed Yuan Shih-kai. But he being endowed with the nature of a wolf could not alter his motives and seize the opportunity to display better intentions.

Although peace and order existed in the provinces he suddenly despatched troops to various points on the Yangtze River. Although there was trouble along the Mongolian frontier threatening our country he deliberately, sent troops to stir up internal trouble. From this we see his lack of statesmanship, and his desire to desert the country when attacked on the frontier so that he could persecute and crush all those who do not happen to hold his opinions. It seems to me that he is most inhuman, and intends to destroy the Republic. Who with any hopes for posterity can allow this kind of thing to proceed?

Now I have been appointed by the Tutuh of Kiangsu as Commander-in-Chief of the Kiangsu Punitive Expedition against Yuan Shih-kai. I now see how eager the people are to help the movement, and only regret that we delayed action so long, but now I will take the opportunity of making up for lost time. We are quite ready to advance towards the North and I earnestly invite the co-operation of all who have the interests of the Republic at heart so that success may be secured.

Although I have no great ability, yet I am not afraid, and even if I meet with my death in this expedition I shall be satisfied. I pray that the spirits of our ancestors will help us in this great struggle. When the people take an interest in national affairs, despots tremble. My only object is to drive away this traitor Yuan Shih-kai, and when that is done I shall sheath my sword and return home, leaving better men to carry on the work of government. If I have any selfish motives, then may Heaven destroy me. I send this message with my eyes wet with tears."

General Chen Chi-mei was appointed to be Commander-in-Chief of the Shanghai "Punitive Expedition," and on July 18 he declared the independence of Shanghai from the Central Government. He issued the following four proclamations:—

(1) To the officials of Shanghai.—I have been authorized by Tutuh Chen Teh-chuan and General Huang Hsing to organize an expedition in Shanghai, and besides the troops which have been placed under my control, all civil and judicial affairs, foreign intercourse and means of communication have been turned over to me. Therefore, I exhort all officials to remain at their posts and maintain order, and if any of them quits his post without previously having obtained permission, he will be dealt with by martial

law. (2) To the merchants and people,—The object of this expedition is solely to punish Yuan Shih-kai, and not to disturb the peace. I undertake to afford protection to all merchants and citizens and to preserve order. I will keep the army under strict control and suppress brigands and bad characters, so that all may enjoy peace. We resort to arms because we have no other means of defending a righteous cause. I hope all will countinue to pursue their callings without interruption, not spread rumours and not disturb the peace, otherwise they will be dealt with by martial law. (3) The object of recruiting soldiers is for th protection of the people and to meet absolute exigencies. Therefore, we will not have more soldiers than are absolutely necessary, so as not to waste money by way of payment of troops. We are forced now to recruit only sufficient troops to meet our present needs, so that the people may not suffer by an abnormal enrolment of troops. We therefore let it be announced to all that without our orders to recruit soldiers, those guilty of an infraction of our commands will be severely punished. (4) To the troops.—The greater part of the troops had served under me formerly. It is scarcely necessary for me to remind them that this petition is for a righteous cause, and, besides maintaining the order of the place, they have also to work in harmony with one another, so that the peace of the place may be entirely preserved. We therefore issue the following regulations for observance:—1. Those who privately recruit soldiers shall be killed. 2. Those who disobey orders shall be killed. 3. Those who, during an engagement, retreat without orders shall be killed. 4. Those who are lazy and do not perform their duties shall be killed. 5. Those who spread rumours and generally create trouble shall be killed. 6. Those who molest the people shall be killed.

Very little authentic news was coming through at this period, but it was apparent that the Government troops had rather the better of it in Kiangsi, while General Huang Hsing's army which had proceeded along the Tientsin-Pukow Railway to the north of Hsuchowfu, had not fought any engagement of importance.

At Shanghai the Arsenal was garrisoned by between 1,500 and 2,000 northern troops, who had arrived on July 6, and six Chinese men-of-war were also in the river off the Arsenal. Reports were freely circulated that the Navy and the Arsenal defenders had been bought over to the rebel cause, but subsequent events showed that they were unfounded. The Woosung forts, however, declared for the rebel cause.

On July 18 Kwantung declared its independence and the following proclamation was issued by the Tutuh, Chen Chuing-ming, and the Provincial Assembly:—

"The fates have been cruel to our Republic. Under the appearance of a Republic Yuan Shih-kai rules with absolute despotism. All his crimes cannot be enumerated, but we can mention at least twelve which are prominent:—

1.—Generals Chang Ching-wu and Fang Wei assisted in the hard work of the revolution, and afterwards retired and became civilians. Yuan Shih-kai on the strength of a telegram from Wuchang had them executed without a trial.

2.—He issued rules for the appointment of officials without first referring them to the National Council, which proceeding was contrary to the Constitution.

3.—He hired assassins to murder Sung Chiao-jen, and when proof was produced he allowed Hung Shih-tso to escape, and arranged for Lin Shih-ching and Tsen Ping to be poisoned at Peking.

4.—When the complicity of the Government in the murder of Sung Chiao-jen was discovered he tried to suppress protests from the people by force, and fearing that his funds would not be sufficient he borrowed money from foreigners against the protest of Parliament, and several Tutuhs.

5.—Although confusion reigned at Urga he took no practical steps to put it right, so that that territory is practically lost.

6.—He connived at Russian advances in Mongolia and the British claims in Tibet, hoping to curry favour with those powers when he wanted a loan.

7.—For over a year nothing has been done, and ever since Chao Ping-chun became Premier all official posts have been filled by corrupt officials. Bribery is worse now than in the time of the Manchus.

8.—Millions of dollars have not been accounted for, and when the Budget was presented to Parliament only the barest outline was given Such criminal negligence will ruin the nation.

9.—While ordering the Southern troops to be disbanded he daily recruited troops in the North. His motive was obvious to everybody.

10.—He bribed members of Parliament to obstruct the work of that body so that he could rule as dictator.

11.—He assisted malcontents in Kiangsi, Kiangsu and Kwangtung so that trouble would break out, and give Government an excuse to send troops to those Provinces. Warrants had been issued in Kwangtung for the arrest of Wong Ho-shun and Huang Shih-lung, who were ringleaders in a petty revolt, but Yuan Shih-kai invited them to Peking where he gave them office.

12.—He sent emissaries to Shanghai to entrap some labour leaders into an attack on the Arsenal so as to arouse resentment among the people. He also brought a false charge against General Huang Hsing for an alleged plot against the Government.

For all these crimes Yuan Shih-kai is responsible, and besides he has not attended to the wishes of the people. He dismissed the Tutuhs without reason and against the wishes of the Provinces concerned Recently he sent troops to Kiukiang and Shanghai to try to overawe the southern troops, but the Kiangsi troops could not stand this, and resisted the advance. Within five days Kiangsu and Anhui followed suit.

The Cantonese people love the Republic, and this assembly and the Tutuh realising the enormity of the guilt of Yuan Shih-kai have decided this day to declare the independence of Kwangtung, and have severed connection with Peking, We have organised an expedition against Yuan Shih-kai, and about 60,000 of our compatriots will shortly be sent to the North, and there can be no doubt that they will annihilate the opposing troops.

We invite all the Provincial Assemblies to join in this righteous movement so that the Chung Hwa Republic may be consolidated and prosperity, peace and justice may reign in this land."

The attitude adopted by Dr. Sun Yat-sen remained in doubt until July 21 when he published the following manifesto:—

When peace was concluded after the Revolution and North and South were united thereby, I recommended Yuan Shih-kai to the National Assemby as Provisional President, hoping he would frankly and sincerely be loyal to the Republic, and thereby prove himself worthy of the trust reposed in him by the 400,000,000 people. Since then I have studiously avoided politics and power and assiduously supported him when his conduct created suspicion in the nation. Even when the most spirited section of the people remonstrated with me for doing so I have not changed my policy. Unexpectedly, when the Sung case came up Yuan's wicked schemes were all exposed and I made known that I would then oppose Yuan. If Yuan Shih-kai had had any sense of honour, since public opinion was thus against him, he would have retired from office so as to appease the people. Unfortunately, Yuan continued to

Dr. Sun Yat-san, who telegraphed to Yuan Shih-kai on July 20 demanding that he should resign

work for his own selfish ends and did whatever he pleased, until at last the people of the East and South were compelled to take up arms to expel him. For a little over a week the movement against Yuan Shih-kai has gathered strength. The safety or danger of the country and life or death of the citizens entirely depend on whether Yuan chooses to remain or go. As a public servant he has not only not placed the country's happiness before his own private interests, but has also sacrificed the lives of the people by plunging the country into war simply to maintain his position. The Republic is only in its infancy, and it is dangerous to create such precedents. I therefore earnestly hope that the people will all ask Yuan to retire so that the war may be stopped, the country be saved, and the wishes of the people may prevail.

On the same date the following telegram was addressed by Dr. Sun to Parliament, the Cabinet, the Tutuhs, the armies and the people of the various provinces:—

Since the uprising in Kiangsi, Nanking and other places have responded to the call to arms, with the object of punishing Yuan Shih-kai and not to secede from the Central Government, nor by reason of any ill-feeling between North and South. The sole object of the rising is to remove Yuan from the Presidency. The people are fully determined to sacrifice their lives in order to attain their object. This being the case, the responsibility for the disaster of a protracted and sanguinary conflict rests entirely on the shoulders of Yuan Shih-kai. It is reported that Yuan Shih-kai is determined to oppose the people by force of arms and so no matter who emerges victorious from the conflict or who sustains defeat, a terrible slaughter of the people cannot be avoided. If Yuan had not acted against the Constitution, the movement on the part of the people of the East and South would have been devoid of justification, but Yuan Shih-kai's constant violations of the Constitution are known to all, and the people have no other means but to resort to arms to remedy that which peaceful means have failed to accomplish. Not only do the people deserve and are entitled to sympathy, but their cause is righteous. Even if Yuan's actions are capable of being rectified by other means, and even if these actions have been right, when the people of six or seven provinces have determined to sacrifice their lives in order to oppose his tyranny, as a public servant, he should have retired ere this, so as to appease public feeling. Not only in a Republic is such a course of action imperative, but even in the case of Constitutional Monarchies, when Ministers of State are opposed by the people, they submit to the will of the populace and retire, Last year, when Prince Katsura formed his Cabinet, the people of Japan rose against him and he had to retire. If this is possible in monarchical countries, how much more incumbent is it on a servant of the Republic to bow to the will of the people and not have recourse to arms to maintain his position? If Yuan Shih-kai really intends to wage war with the people, in order to forcibly maintain an untenable position, he will not only invite disaster on the country, but he will make himself the laughing-stock of the world. It will be remembered that in 1912, a dynasty over two centuries old, in order to prevent useless bloodshed, abdicated and Yuan Shih-kai helped to persuade the Emperor to retire. If Yuan Shih-kai can advise others to submit to the inevitable, why cannot he adhere to the principle of the advice which he tendered to the Manchu Dynasty? Again, when the representatives of 17 provinces elected me as President in Nanking, I recommended Yuan Shih-kai to the National Assembly to be my successor, because I heard that the North had agreed to join the Republic. At the time, some of the representatives reproached me for lightly treating my responsibilities and the trust reposed in me, but nevertheless I retired, hoping that peace would soon be restored and the country become united. Yuan Shih-kai, therefore, cannot now say that the officials under him want him to stay and will not allow him to listen to the words of the people of the East and South. The decision rests in his own hands, and on him will devolve the respon-

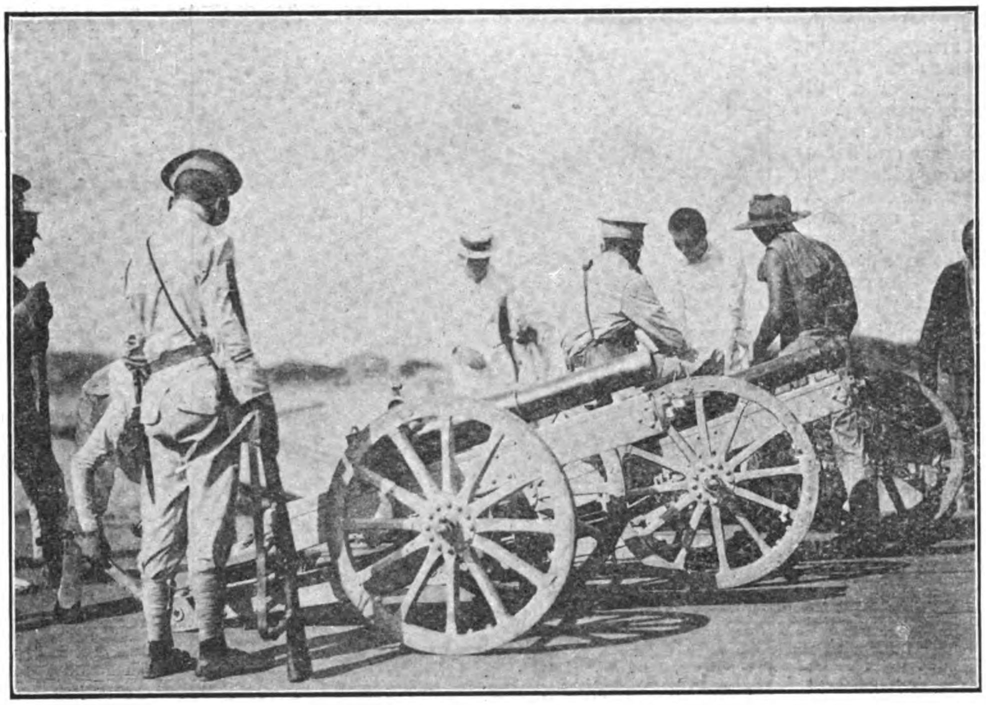
General Huang Hsing, who started the revolt at Nanking

Tutuh Chen Chuing-ming, who declared the independence of Kwantung

General Chen Chi-mei, the head of the short-lived Military Government in Shanghai

sibility for bloodshed and misery if he refuses to bow to the inevitable.

You are the protectors of the Republic and the people look up to you to preserve intact the Constitution of our beloved Republic. At this critical period in China's history, I trust you will have great regard for the lives of the people and will try to save the dangerous situation by asking Yuan Shih-kai to retire, so as to put an end to civil strife. If, however, Yuan Shih-kai is stubborn, and would rather sacrifice the lives of his fellow-countrymen than forego his position of President, I believe you will also not spare this man who has brought down disaster on this distracted country and I too will follow the people and will not look back until he is deposed.



A rebel field gun

Photo by Burr Photo Co.

It was expected by the Kuomingtang leaders that the Chekiang Tutuh, Chu Jui, would support the rising, but he proclaimed that he would maintain neutrality, and to this determination he adhered. The province of Fukien, however, joined in the movement.

The activity of General Chen Chi-mei's Military Government in the International Settlement of Shanghai led to the Municipal Authorities showing that they would not tolerate any interference within municipal bounds. The Military Government re-appointed Mr. Y. C. Tong—who had been removed by the President—Director of Telegraphs and Mr. Yun, the official who had taken Mr. Tong's place, was expelled. The Municipal Police reinstated Mr. Yun and intimated that he would be maintained in his position by force if necessary. The Military Government also asked Mr. Ivan Chen, the Commissioner for Trade and Foreign Affairs, to accept office under their authority, but Mr. Chen declined.

Apparently up to July 22 the rebels thought that they had a prospect of buying over the northern troops in the Arsenal and the Navy. As, however, it had become evident that the loyalty of these men could not be shaken, and perhaps, because it had become necessary for strategic reasons to take some action, it was decided to endeavour to take the Arsenal by assault. General Chen Chi-mei had about 7,000 men under his command. The attack began at 3 a.m. on July 23 and was sustained until 6 a.m. when the rebels retired. The Navy assisted the Arsenal defenders. The attack was renewed at 9.45 o'clock on the following night, but the rebels were repulsed with considerable loss. At about 9.15 p.m. on July 25 another attack was made, which continued until 4.30 a.m. on the 26th. This attack was also beaten back and a number of the rebels deserted. In fact the desertions began after the first night's fighting.

While the fighting was going on the residents of the French Concession and the International Settlement were in considerable danger. Shells from the naval guns dropped in different parts of the Settlement and the majority of foreigners left the residential quarters of the French Concession. A protest was sent by the Consular Body to the loyalist Admirals Li and Tseng, who expressed regret, and a promise was given to prevent as far as possible danger to foreign life and damage to foreign property. The Shanghai Volunteer Corps and the French Municipal Volunteers were on duty practically throughout the fighting to prevent any attempt being made by the combatants to enter the Settlements. A regular exodus of Chinese refugees into the Settlements set in as soon as hostilities began. A considerable portion of the native city was destroyed by fire during the fighting and the homeless people flocked into the Settlements. A warning by the Admirals that Nantao would be bombarded if it continued to be used as the rebel headquarters accelerated the exodus.

The position was regarded as so serious by the Consular and Municipal Authorities that on July 26 a notification was issued as follows:—

"The foreign Settlement of Shanghai has been established primarily for purposes of trade. During the past few days trade has been disturbed, and the Settlement disorganised, owing to insurrection in the surrounding districts. Now therefore the Foreign Consuls and Municipal Council hereby declare that neither the Settlement nor the Northern Suburb shall be used as a base for warlike operations, or as a focus of intrigue. To prevent belligerent operations across the Settlement and to secure the general welfare of the peaceful people of all nationalities Chinese troops of whatever party must forthwith vacate the Northern Suburb. Those who are concerned as leaders in the present operations, of whatever party, whether military chiefs or civil officials, are hereby required to remove beyond the Settlements and Northern Suburb, under penalty of arrest.

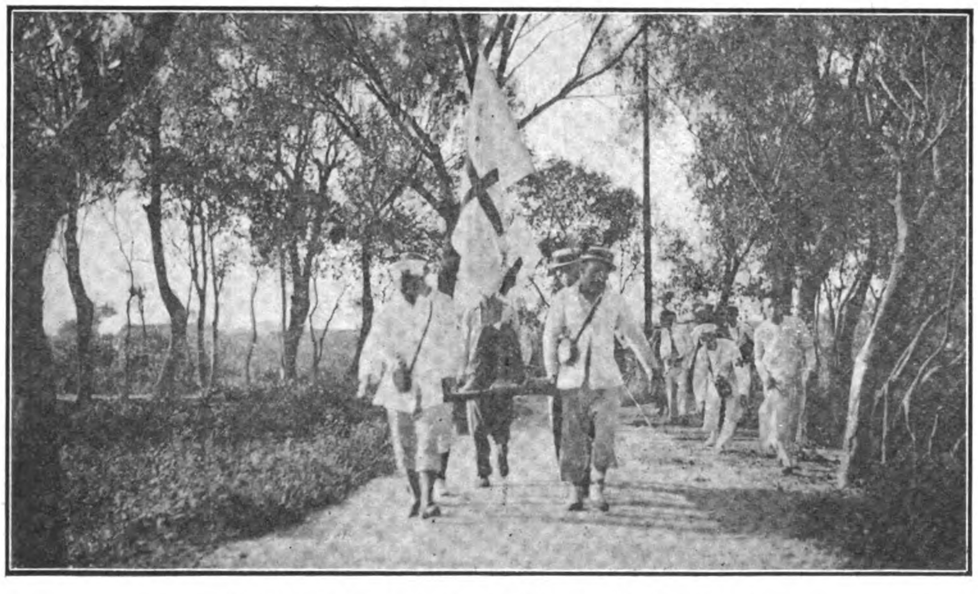
"The Police will take immediate steps to carry the foregoing into effect.

"Sailors from the Foreign men-of-war will land and occupy selected positions on the west and north of the Foreign quarter.

"Guards will be stationed on the Soochow Creek to prevent its use for the transport of Chinese troops.

"Issued for the information of the Public,
"By order,
"W. E. Leveson,
"Secretary.

"Council,
"Shanghai, July 26, 1913."



Red Cross Squad on the road leading to the Arsenal

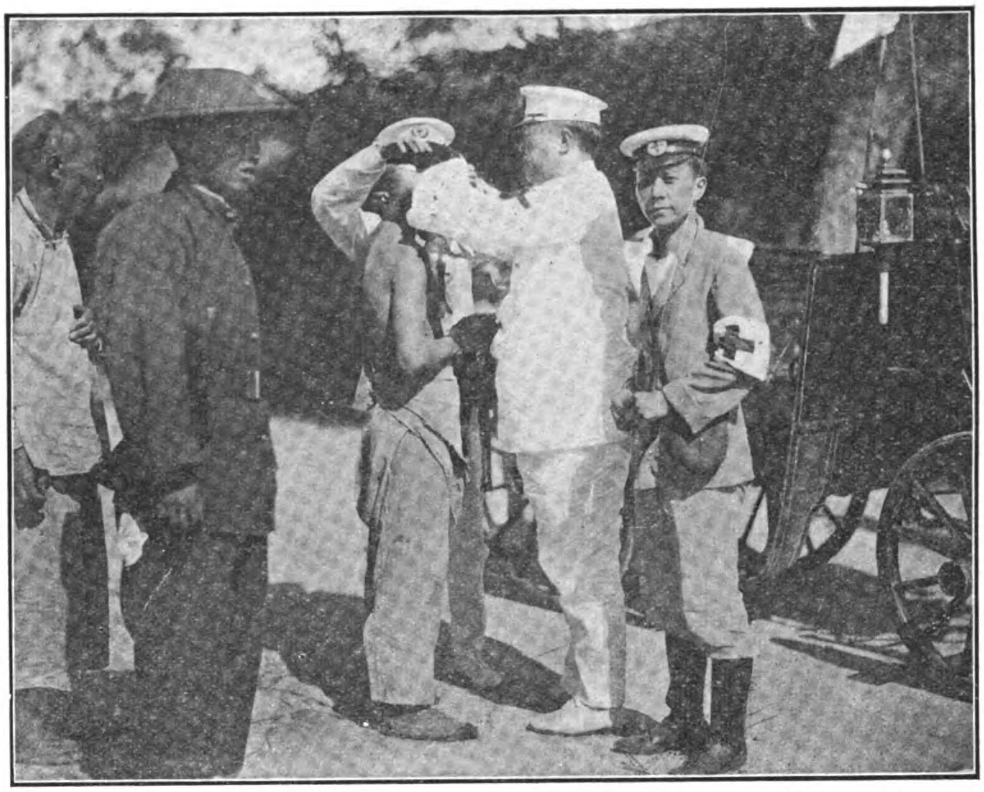
Photo by Burr Photo Co.

As a sequence to this some 350 blue jackets were landed. On July 27 the Shanghai Volunteer entered

the Chapei district, which is under Chinese jurisdiction and there disarmed 300 rebels and took possession of a battery of field artillery. General Chen Chi-mei had previously removed his headquarters from Nantao to Chapei.

When the foregoing was written the back of the rebellion appeared to have been broken, although a strict Government censorship of telegrams made it impossible to form a final opinion.

On July 24 a President Mandate was issued dismissing Dr. Sun Yat-sen from his post as Director-General of the Chinese National Railway Corporation.



Red Cross doctor treating a rebel wounded in the attack on the Shanghai Arsenal
Photo by Burr Photo Co.

Yuan Shih kai's answer to the numerous manifestoes was, in part, as follows:—

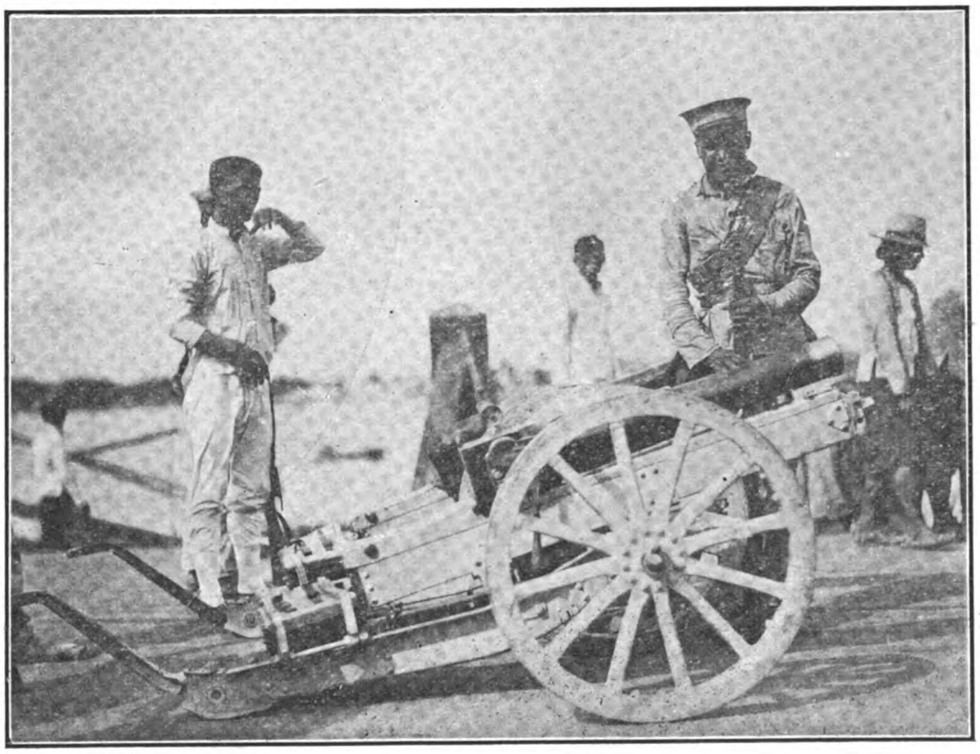
Huang Hsing, formerly Governor-General of Nanking, returned to Shanghai to consult physicians after he had resigned the director-generalship of the Hankow-Canton and Szechuan Railways. On July 12, he suddenly went to the quarters of the 8th Division at Nanking, and incited the troops there to coerce Chen Teh-ch'uan, Tutuh of Kiangsu, to join him in plotting a rebellion. Chen Teh-ch'uan left Nanking for Shanghai; and Huang Hsing falsely used the name of the Tutuh in issuing a proclamation, declaring independence and styling himself Commander-in-Chief of the T'ao Yuan Army. In a telegram to Li Liehc-hun at Hukow, he said that the independence of Kiangsu would greatly help Li in his rising. He sent rebel troops to attack Hanchuang several times. He ordered Pah Wen-yu, of his desperado party, to steal a march upon Linhuai and Chen Chi-mei to attempt to occupy Shanghai. He persuaded the rebel force at Woosung to fire upon the cruiser Feiying. He killed Wu Shao-ling, commander-in-Chief of fortifications, Pu Chien, Vice-Chancellor of the Military Academy, Chen Fung-chang, Training Officer of the Guards, and many persons. He has even declared in Shanghai that he would not care at all even about foreign intervention. His one desire is to destroy the Republic and to sacrifice lives.

Then Huang Hsing's ferocious nature and his complicity in the Wuhan plots, as well as his despatching assassins to Peking to commit murders, funds of the Nanking Government to pay his barbarous gang, and his concealment of public loan bonds valued at several million dollars for the propagation of sedition amongst the troops, are recounted in indignant terms; the Government can tolerate him no longer. Since Huang Hsing, Chen Chi-mei and Pah Wen-yu have so openly defied the law, the merchants and people hate them so intensely that letters and telegrams praying for their punishment have been pouring in large numbers.

Feng Kuo-chang and Chang Hsün are hereby commanded to punish the rebel troops speedily, and at the same time to offer rewards for the capture of the rebel chiefs. Any of his adherents and followers that can capture or kill Huang Hsing and his appropriation of others to redeem their own sins shall also be given pecuniary rewards. Those who voluntarily come over and surrender themselves shall also be pardoned of their former offence. I, the President, will only inquire as to persons being loyal or rebel, regardless of parties or classes.

An indication of the large and growing field in Australia for railway and tramway material was given by Mr. T. R. Johnson, Chief Commissioner for Railways and Tramways of New South Wales, in his evidence before the Dominions Royal Commission. During each of the last two years, he said, the department had met considerable difficulty in placing orders for 3,000 tons of rails, and after months of delay had only been able to secure lots of 1,000 tons a month. With regard to locomotives, the department had ordered some 100 locomotives from Great Britain during the past six years, and was building at the rate of two a year locally. "We," continued Mr. Johnson, "want rails, and we want people to take our orders. It seems a short-sighted business for British manufacturers to ignore the business that is to be done in the future in these great Dependencies."

The Minister of Railways and Canals in the Canadian House of Commons on May 28th made the statement that the National Transcontinental Railway will be finished next year. The expenditure on the work this year will amount to nearly four million pounds. The total expenditure to the end of 1912 was given by the Minister as twenty-five million pounds, and the estimated cost to complete the railroad is seven million pounds. The only section of the work in which track has not yet been laid is a 60-mile stretch between Cochrane and Quebec. It is expected that the line will be finished to Cochrane this autumn, and by next year to Quebec, where the car ferry will be in operation until the great Quebec Bridge is completed. The line between Quebec and the New Brunswick boundary will be finished in three months, and the part east of that is now being operated by the Government in connection with the Inter-Colonial Railway. The Grand Trunk Pacific Railway, being the portion from Winnipeg to the Pacific coast, will be completed next year, and trains will then be able to cross the continent. This will complete the second coast to coast railway in Canada. The third Trans-continental railway, the Canadian Northern, is also making rapid progress towards completion, and is already operating its trains through immense stretches of the total distance from the Atlantic to the Pacific.



Another Rebel Field Gun
Photo by Burr Photo Co.

NEW MOTOR VESSEL.

At the Taikoo Dockyard was launched the motor driven vessel Ah Kwang, built to the order of the Asiatic Petroleum Company. Considerable interest is being taken in the boat in shipping circles in the East, as she is the biggest oil vessel launched outside Europe. The Ah Kwang is a steel built craft specially constructed for carrying oil in case, her principal dimensions being, length over all 220 feet, breadth 32 feet, and depth 9 feet 6 inches.

The motive power for main and auxiliary purposes is supplied by Bolinder's motors, supplied by the maker's local representatives, Messrs. Ulderup and Schluter. The main set consists of two four cylinder engines each developing 240 brake horse power, which are designed for a speed of nine knots with full load. The engines are exceedingly simple; they reverse direct, there are no valves, camshafts or gears, and no electric ignition appliances to complicate them.

The oil generally used in these motors as fuel, is Tarakan Oil fuel on account of its cheapness and because it can be obtained in almost every place in China where is a crude oil motor. But all other brands of crude oil as well as of kerosene have been used in these engines with equally good results.

The Ah Kwang is splendidly fitted, and electric light is installed throughout, motive power for the dynamo being supplied by a direct coupled Bolinder motor. The vessel is fitted with one pole mast and awnings all fore and aft and presents a rather unusual appearance. She is capable of carrying about 40,000 tins of kerosene when fully loaded.

Tsen Chun-hsuan, Generalissimo of the Rebel forces

RAILWAYS AS EDUCATORS.

"The schools of the Philippines have done much to bring the people of the islands to a high stage of development, but in my opinion the railways that have been built in the islands also have been of great assistance in arousing among the inhabitants a keen desire to accept the white man's way," said James Ross, general attorney for the Philippine Railway Company, who is in Washington.

"I have been in the islands for thirteen years, and without fear of contradiction I may say that railway construction has done as much in its way as soldiers and schools, because wherever we built roads the native who had previously got little or nothing for their labour received rewards that were far in excess of anything they had ever expected. It encouraged the men to further efforts ; it made the lazy natives ambitious for the first time in their lives, and brought prosperity to communities that had been nothing but collections of shacks. I have seen places were we built stations that were only clusters of thatched houses grow to towns inside of a few months. During the last three years we have built 200 miles of road onthe island of Cebu, and 100 miles in Panay.

"When it is realized that the last rice crop of the islands was worth $15,000,000, it is easily understood that business is rapidly increasing, and this is due to railway development. Our road has experts traveling along its lines all the time giving instructions to the natives regarding the planting of rice, cane, and other crops. I feel that the railways have done their part in the upbuilding of the trade of the islands and the people."

General Poh Wen-wei, one of the rebel leaders with Huang Hsing

General Li Lieh-chun, rebel leader in Kiangsi

CHINA'S BUDGET.

Figures for First Half of 1913.

The following, prepared by the "Peking Daily News," is a summary of the Budget submitted to the Chung Yi Yuan for the various offices and Yamens of the Central Government, commencing from the first to the sixth month of the Second Year of the Chinese Republic.

Explanations.

The Budget for the 1st to the 6th months of the Second Year of the Republic of China is divided into General Sections and the Separate Sections, and the division of the former are called items and those of the latter are called details.

The amounts budgetted are reckoned in current dollars down to tenths of a cent. All the tael items in the original have been converted into dollars: hence one Kuping Tael is recorded as $1.50 of the usual currency, and one Kinping tael, $1.40.

The General Sections of the Annual Expenditure have been recorded according to the lists submitted by the various Ministries and the organs under their control. With reference to the General Sections of Annual Receipts, as at present the system of taxation has not yet been settled the amount derived from receipts is not great, but they have temporarily been recorded in accordance with the lists submitted by the various ministries, etc.

In order to avoid errors the Detailed Sections of the Receipts and Payments of the various ministries have been recorded as received from them.

After auditing the estimated payments submitted by the various ministries, this ministry compared the figures of the payments of the six months for the various ministries with those of the Provisional Budget for the four months proportionately, and the causes of either increase or decrease have been stated in the Detailed Sections, so that there will be no misunderstanding. With regard to the receipts of the various ministries the amount is not a great one and moreover the various provinces have not yet all submitted reports to this ministry. Therefore with the exception of the Ministry of Communications the four departments of which, the Posts, Telegraph, Navigation and Railway, form a special estimate, the receipts of which can be recorded, the receipts of the rest of the Ministries cannot be similarly treated.

According to the Provisional Budget the pay of the Eight Banners at Peking is grouped under the estimate of the Ministry of War, while in fact the said pay is connected with the livelihood of the Manchu people, and has nothing to do with military expenses. Hence it has been placed temporarily under the estimate of this ministry. With regard to the pay of the Banners at Chihli, Jehol and Chahar, it has hitherto been issued from the treasury of this Ministry. As it has not yet been abolished, the amount budgetted for them has been half of that which has been allotted to them annually.

According to the estimate of the Ministry of War the expenses of the 8th division of the 2nd Army of Nanking include a certain amount of bonds of public loans in lieu of cash payment, and as such practice would interfere with the uniformity of other Ministries, it has been left out of the General Sections of the Budget.

In compiling the present Budget this Ministry repeatedly telegraphed to the various provinces, requesting them to make telegraphic replies regarding the remittances they would send. According to the telegrams from Chihli and other provinces the total amount they should remit is more than $18,000,000. Whether the said amount is remitted accordingly will be decided when the accounts are made up

As the four departments of the Ministry of Communications,—the Railway, the Posts, the Telegraph and the Navigation, and the Mints and the Printing and Engraving Bureau, both of which are under control of the Ministry of Finance, have formed a special estimate, the surplus or deficit of these items should have been recorded in the total receipts or payment of the General Section of the Budget. But, as the receipts have not been recorded in the original estimates of the Navigation Department and the Printing and Engraving Bureau the payments of both alone have been recorded, so that there will be no omission and they may be easily audited.

Some of the estimates submitted by the various Ministries and the various Yamens at Peking, are wanting in details and erroneous, and moreover there is a lack of uniformity in form. However it is expected that improvements will soon be effected so that perfection may be attained later on.

Gross Totals.

The following are the gross totals of the present Budget, from the first to the sixth month of the second year of the Chinese Republic:—

Total Receipts..	$51,336,880
Total Payments	$168,823,452
Deficit	$117,486,572

When compared with the Provisional Budget of the four months, the expenses have increased tremendously.

Summary of Expenditure.

Ministry of Foreign Affairs:	
Ordinary	$1,570,356
Extraordinary	$453,787
Total	$2,033,143
Ministry of the Interior:	
Ordinary...	$1,835,191
Extraordinary	$300,510
Total	$2,135,701
Ministry of Finance	
Ordinary...	$87,763,001
Extraordinary	$2,867,103
Total	$90,630,104
Ministry of Education	
Ordinary...	$2,238,801
Extraordinary	$4,048,850
Total	$6,287,651
Ministry of War	
Ordinary...	$20,273,449
Extraordinary	$2,563,309
Total	$22,836,758
Ministry of Navy	
Ordinary...	$1,724,954
Extraordinary	$8,229,250
Total	$9,954,204
Ministry of Justice	
Ordinary...	$740,448
Extraordinary	$361,587
Total	$1,102,035
Ministry of Agriculture and Forestry	
Ordinary...	$1,369,228
Extraordinary	$1,545,325
Total	$2,914,553
Ministry of Industry and Commerce	
Ordinary...	$13,319,656
Extraordinary	$110,000
Total	$13,429,656
Ministry of Communications	
Ordinary...	$705,224
Extraordinary	$16,794,423
Total	$17,499,647
Grand Totals	
Ordinary...	$131,549,308
Extraordinary	37,274,144
Total	$168,823,452

Summary of Receipts.

	$
Ministry of Foreign Affairs... ...	18,440.000
Ministry of Finance	2,679,169.343
Ministry of Education	89,912.024
Ministry of Agriculture and Forestry	14,530.970
Ministry of Communications ...	276,280.000
Remittances promised by the provinces	18,551,846.070
Customs Revenue	29,706,701.559
Total	$51,336,879.966

Remittances from the Provinces.

	$
Chihli	1,155,246.00
Fengtien	488,616.00
Kirin	135,000.00
Heilungkiang	45,000.00
Honan	2,088.371.12
Kiangsu	5,370,531.75
Chekiang	975,000.00
Kiangsi...	2,955,000.00
Hunan	2,174,761.50
Shansi	150,000.00
Shensi	1,134,053.25
Sinkiang.	331,023.75
Shantung	1,149,242.69
Kiangsi (Public Loan a/c)	400,000.00
	$18,551,846.07

Particulars of Expenditure.

The Ministry of Foreign Affairs:

The expenses for the Ministry itself are $204,532, including salaries $161,988. Extraordinary expenditure $117,000.

Amount budgetted for Legations and Consulates abroad. Ordinary $933,756, including salaries $609,156. Extraordinary $291,000.

The Ministry of the Interior:

The ordinary expenses of the Ministry itself are $256,372, including salaries $207,192. Extraordinary $126,800.

The Ministry of Finance:

Ordinary expenses of the President's Office are $226,920, of which $130,950, is for salaries. Extraordinary $303,000.

Ordinary expenses of the Tsan Yi Yuan, $137,892.25, including salaries $118,228. Extraordinary $32,800.

Ordinary expenses of the Cabinet, $159,682.-00, including salaries $20,400. Extraordinary $6,300.

Ordinary expenses of the Secretary's Office of the Cabinet, $65,312, including salaries $49,002. Extraordinary $3,240, including salaries $2,040.

Ordinary expenses of the Bureau of Legislation, under the Cabinet, $39,037.40, including salaries $32,270.40, and expenses of the Compiling Committee of the Bureau, $34,326, including salaries $34,326.

Ordinary expenses of the Bureau of Civil appointments, $27,210, including salaries $23,040. Extraordinary $2,416.

Ordinary expenses of the Bureau of Printing and Engraving. $94,605, including salaries $43.350.

Ordinary expenses of the Bureau for Mongolian and Tibetan Affairs, $655,049, including salaries $50,976. Extraordinary $209,176.

Ordinary expenses of the Provisional Bureau of Merit, $54,498, including salaries $44,196. Extraordinary $1,800.

Ordinary expenses of the Audit Bureau, $68, 869.40, including salaries $62,136. Extraordinary $4.950, including salaries $3,750.

Training institute for Book Keeping $2,400, including salaries $1,284.

Ordinary expenses of the Ministry itself, $250,512.84, including salaries $237,102.84. Extraordinary $209,080.

Ordinary expenses of the Salt Gabelle Office, $64,152, including salaries $59,568.

The pension for the ex-Imperial family $2,-800,000.

National Debts, $79,199,844.91.

Shui Wu Chu $55,155.40, including salaries $47,751.08.

Extraordinary, Balance to be kept by the Ministry $2,000,000.

The Ministry of Education:

Ordinary expenses of the Ministry itself $198,844, including salaries $172,671.

The Ministry of War:

Ordinary expenses of the Ministry itself $97,546.941. (salaries not given). Extraordinary $28,020.

First Army Division $1,159,702.483, including pay $760,075.093.

2nd Army Division, $1,039,903.772, including pay $719,141.641.

3rd Army Division, $1,150,140.64, including pay $765,993.807.

4th Army Division $921,405.928, including pay $629,601.374.

5th Army Division $1,018,163.876, including pay $659,316.047.

Peiyuan Arsenal $460,630.257, including salaries $125,099.201.

Hupeh Arsenal $750,034, including salaries $241,642.

Kiangnan Arsenal $984,509.522.

Expenses of the advisory department, $37,300, including salaries $37,300.

Ordinary expenses of the Nanking armies which have been paid by the Ministry of War after the abolition of the post of the Resident General are as follows:

(1) The first army of the ex-Resident General, $1,182,900.

(2) The second army of the ex-Resident General, $1,338,912 in cash and $118,380 in notes of the public loan.

(3) The 8th army division $644,576.574 in cash and $65,646 into notes of the public loan.

Ordinary expenses of the Board of the Chief of the General Staff, $420,002.72 including salaries $307,594.32. Extraordinary $778,890.

Kung Wei Army, $1,568,270.766, including salaries $1,047,733.334.

Ching Wei Army, $1,270,267.569, including salaries $810,336.083. Extraordinary $364,050.

Yi Army $1,082,181.831, including salaries $805,365.759.

The Front Wu Wei Army $949,407.645, including salaries $739,362.134.

The Military office in the President's Office, $98,028, including salaries $86,508. Extraordinary $70,000.

The Ministry of Navy:

Ordinary expenses of the Ministry itself, $230,118, including salaries $200,712. Extraordinary $2,001,740.

The Ministry of Justice:

Ordinary expenses of the Ministry proper $238,964, including salaries $174,396. Extraordinary $208,000.

The Supreme Court, $120,877, including salaries $88,932.

Procuratorate General, $43,451, including salaries, $32,730.

The Ministry of Agriculture and Forestry;

Ordinary expenses of the Ministry proper, $309 241.82, including salaries $190,000. Extraordinary $177,855.

Places for Agricultural Experiments $33,356.30, including salaries $14,245. Extraordinary $14,520.

Fishery Bureau $126,000, including salaries $83,520. Extraordinary $96,000.

Cultivation Bureau $23,470, including salaries $22,770. Extraordinary $3,000.

Places for the Experimental Cattle Raising $23,492, including salaries $14,484. Extraordinary $80,200.

Forestry Bureau of Kirin $18,600, including salaries $15,840. The branches, $41,904, including salaries $32,040. Extraordinary for both Head and branch bureaux $160,600.

Places for Forestry Experiments $15,108, including salaries $13,308. Extraordinary $13,300.

Immigration expenses $642,500, including salaries $375,000. Extraordinary salaries $583,160.

Expenses for immigration surveyors $36,400, including salaries $26,400. Extraordinary $11,000.

The Ministry of Industry and Commerce:

Ordinary expenses of the Ministry proper, $196,656, including salaries $145,776. Extraordinary $12,000.

The Administrative expenses of the various industrial organs $2,820,000. Extraordinary $10,000.

The Administrative expenses of the various Commercial organs $4,983,000. Extraordinary $40,000.

The Administrative expenses of the various mining organs $3,920,000. Extraordinary $48,000.

Panama exhibition $1,000,000.

The expenses for the establishment of offices for the investigation of industry and commerce, $400,000.

The Ministry of Communications:

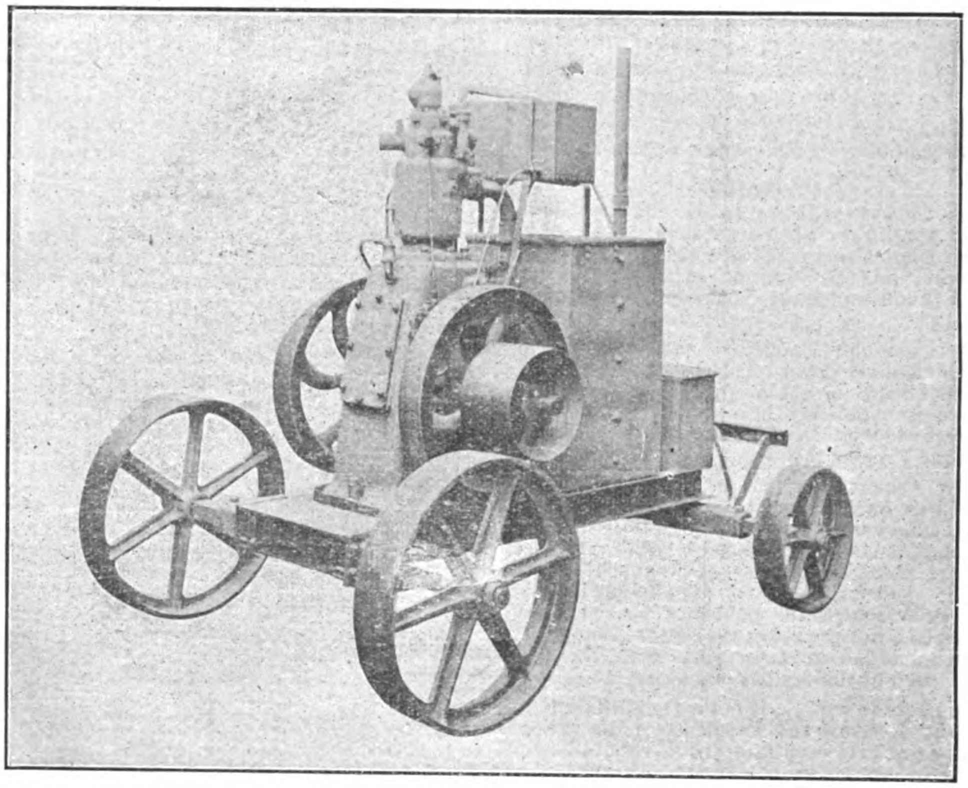
Ordinary expenses of the Ministry proper, $263,406, including salaries $230,448. Extraordinary $39,400.

Educational expenses $174,025.74. Extraordinary $62,666.

Navigation department $267,792.

Extraordinary: Deficit of the Railway Department $8,830,230; of the Telegraph Department $911,905; of the Navigation Department $1,732,500; and the deficit of this ministry to be subsidized by the four departments $5,217,722.

WESTINGHOUSE-CROSS 10 H.P. OIL ENGINE



A PORTABLE OIL ENGINE

The accompanying illustration shows a Portable Oil Engine Outfit, consisting of a Westinghouse-Cross 10 HP Oil Engine, complete with oil tank, water cooling tank, and tool box, and mounted on a rigid channel iron truck.

This outfit is about to be shipped to Australia for use in agricultural work, and it will be noticed that the wheels are specially broad to allow of travelling over up-country roads. The engine is fitted with a special arrangement for circulating the cooling water, which is pumped up to the cylinders and returned to the tank through a very fine rose, thus ensuring an effective cooling of the water as it leaves the engine.

The "Cross" Engine is of the four-cycle semi-Diesel type, and has special patented features, which ensure very complete combustion of the fuel, result being very clean working, with practically no smok from the exhaust, or deposit of carbon on vaves of cylinders. It is, therefore, possible to work for long periods without opening out the engine for cleaning purpose.

THE HUPEH CEMENT WORKS

The following interesting information in regard to the cement works at Tayeh, Hupeh, has been obtained from Chinese sources by the *Central China Post:*—In the second year of Emperor Hsuan Tung the manager of the Hupeh Cement Works raised a Japanese loan of $360,000 from the Shanling Company on condition that the loan should be repaid within six years, the interest to be 7 per cent. per annum All the property of the works was pledged as security. In the following year a Japanese loan of another $360,000 was raised from the same company on the same conditions. Last year the works could not meet its liabilities due to the Japanese firm, and negotiations went on for a time to postpone repayment and pay additional interest. But last November the Japanese creditors finally refused to make any arrangement asking for the closing of the works. The Wuchang government declined the request with plausible excuses and instructed the chief of the Bureau of Industry to liquidate the debts of the works. The Shanling Company threatened to take the property of the works by itself, but its threats were not carried out. This year the works could not make the fourth instalment of the repayment to the Japanese firm in March, and the latter sued the debtor before the Wuchang government. It was stated in the petition that the works owed the Japanese firm 690,000 yen in addition to the value of a large quantity of coal and engines—some 170,000 yen. The government was solicited to stop the operation of the works and to induce the latter to make good the repayment within a few weeks. In case of the failure of the works to effect the repayment, the Wuchang government would be asked through the Japanese Consul to sell the property of the debtor and the money obtained under the sale would be taken as repayment. A telegram was sent by the Wuchang government to urge the manager of the Works to come to Hupeh from Shanghai to meet the demands, but in reply the manager stated that a case had been brought in Shanghai by the Japanese creditor and that he had to face the lawsuit there. In response to the above information, the Japanese Consul informed the Wuchang government that the manager was not in Shanghai and that the office of the works at Shanghai had already been sealed up. The government was again requested to close the works; otherwise it should be made responsible for the losses suffered by the creditor.

PROSPECTS IN MANCHURIA

BRIEF SURVEY OF AMERICAN COMMERCIAL INTERESTS

By Dana G. Munro, University of Wisconsin.*

The three Eastern Provinces of the Chinese Empire, collectively known as Manchuria, have a combined area of about 363,610 square miles, and a population variously estimated at from fifteen to twenty-five millions.[1] They are remarkably rich, both in agricultural products and in minerals.

The soil, with the aid of an abundant and fairly uniform rainfall, produces heavy crops of beans and grain year after year, without showing signs of depletion; while underground there are immense deposits, as yet unexploited, of gold, silver, copper, lead, and coal.

The population consists largely of immigrants, who are coming to Manchuria in great numbers from the less fertile provinces of the empire.[2] These are more progressive and less opposed to foreigners than the people of many other parts of China; and because of this fact, and also because of the greater per capita wealth due to the richness of the land, Manchuria offers an unusually favorable market for foreign products.

In the year 1910, although the provinces were just beginning to recover from the destructive war recently fought within their limits, the total volume of their trade amounted to $110,000,000.

Methods of Communication

This great commercial activity is partly due to the fact that there is no other part of the Chinese Empire so accessible to foreign enterprise. Most of the important cities have been opened to foreign trade, and an extensive railway system, combined with four large navigable rivers,[3] has afforded transportation such as is unknown in the other provinces Until 1898, Newchwang, opened to trade in 1864, was the only port of entry for foreign commerce in Manchuria, although a certain amount of foreign goods came into the country over the Trans-Siberian Railroad in the North.

From Newchwang, merchandise was sent into the interior by means of junks on the Liao River, or overland by cart. In 1898, Russia opened the port of Dalny, within her leased territory of Liaotung, but in spite of constant efforts to divert trade to the new port, Newchwang still retained its commercial leadership.

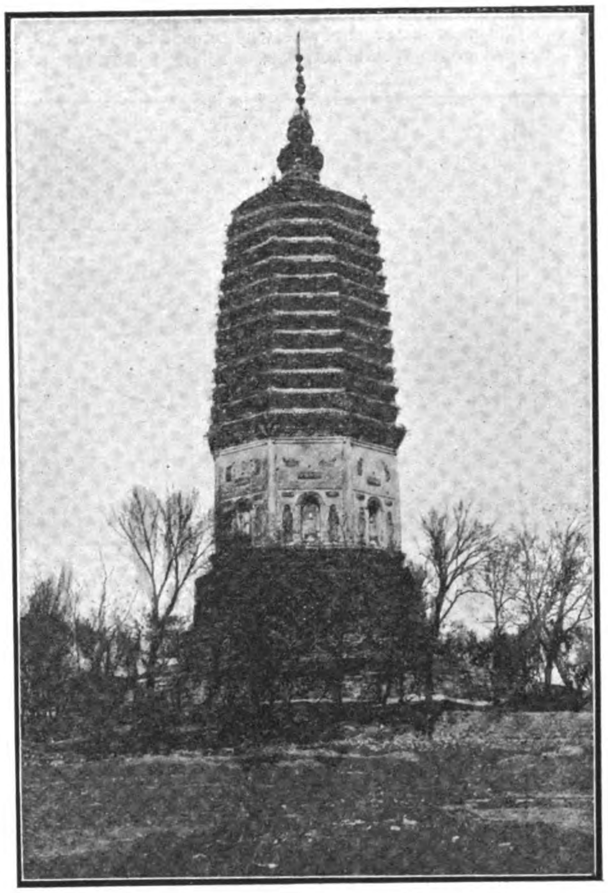
In 1901, the Chinese Eastern Railway, built by Russia, was opened to traffic, connecting these two ports in the South with the Trans-Siberian system and with the cities of the interior. The Treaty of Portsmouth gave the southern section of this line, now called the Southern Manchurian Railway, to the Japanese, who rebuilt it and replaced the old Russian wide gauge by standard gauge, thus making it necessary to transship freight at Changchun, the point of division.

Since the war, also, a great number of new ports have been opened, and Japan has built a railroad connecting Mukden, on the Southern Manchurian line, with Antung and the Korean Railway.

China herself is building a railroad from Changchun to Kirin, which will draw traffic from a large section at present inaccessible.[4]

Trade Disabilities

In spite of these improvements in commercial facilities, trade in this section of China is by no means free from certain disadvantages which have hampered business elsewhere in the empire. The most serious of these is the appalling chaos of the currency system. This cannot be described here, but the state of affairs can be imagined from the statement that there are generally at least a dozen forms of money circulating at each port, and that these vary considerably from month to month in their rate of exchange, not only in regard to gold, but also in regard to each other. Such a condition adds a gambling element to the most conservative business. Recently, on account of pressure from the United States and other powers, steps have been taken towards the adoption of a uniform currency throughout the empire, and a substantial improvement is looked for in the next few years.



The Famous Pagoda at Liaoyang

Another hindrance to trade is the tariff system. Likin, or transportation dues are levied on merchandise at every point where it is possible to establish a barrier, and the resulting expense and annoyance burden commerce considerably. The payment of a 2½ per cent. ad valorem surtax at the maritime customs house is supposed legally to free foreign goods from these dues, but the transit passes secured in this way are often not respected in the interior.[5]

The Principal Exports

Nevertheless, on account of the improvement of trade routes and the opening up of the country, there has in recent years been a great development both of the export and of the import trade of Manchuria.

The principal exports are beans, bean-cake and bean-oil, produced mostly in the two southern provinces. Since the Chino-Japanese war of 1894-5, Japan has bought practically all of Manchuria's bean crop, and her control of the export trade has been an important factor in the competition for the import trade. Recently, small shipments of beans and bean-oil have been made to Europe, and European firms in the Orient hope to increase these to offset Japan's advantage.[6]

In the northern section much grain is produced, which is for the most part consumed locally. The neighboring Russian-Siberian provinces, however, are dependent on this section for flour, grain and wheat, and as they develop by colonization, Northern Manchuria is certain to become more and more prosperous.

Other leading items in the export trade are lumber, wild silk, and minerals. The lumber is cut under Japanese direction from the forests on the Yalu River. The wild silk industry is chiefly in southeastern Shenking.

The vast mineral resources of the country are as yet comparatively undeveloped, although there is an average annual output of about $10,000,000 in value from the gold, silver, copper, lead and iron mines,[7] which are operated chiefly by the natives, and a large amount of coal is taken from the Japanese mines at Fushun, for use on the railroad and on steamers.

Chief Imports

The import trade covers a wide range of articles, but there are certain great staples which have always formed the bulk of foreign shipments to this region. The most important of these are manufactures of cotton, which exceed in value all other foreign imports put together.

Other items are kerosene, which is more andmore widely used, lumber and tobacco.[8]

Flour, brought from the United States, once stood high in the list, but the great output of the mills in Northern Manchuria, which can grind the native wheat and sell it at a price which no foreign flour can touch, has driven out the American product.

At present, there is a promising but as yet undeveloped market for machinery of all kinds, especially for modern agricultural implements, which could be used to good advantage on the rather large farms of the region. These goods must be sold by native dealers in native stores, and the primary consideration which determines the popularity of an article is its cheapness. The better grades of Western manufactures find a market only among the small European element, while inferior goods, produced by cheap Oriental labor, and sold at a low price, are readily accepted. The Chinese are, however, good judges of quality, and are ready to pay better prices for superior goods if they can afford to, so that as the country develops there will undoubtedly be an increasing demand for first-class products.

Discrimination by Russia

Before the Russo-Japanese war, Manchuria imported more goods from the United States than from any other foreign country, and American imports at Newchwang between 1900

*[Reproduced from the "Annals of the American Academy of Political and Social Science." for January.]

[1] The names of the provinces, together with the estimated population of each, as given in the *Statesman's Year Book for 1911*, are: Shenking, 10,312,241; Kirin, 6,000,000; and Heilung-Chiang, 1,500,000.

[2] A recent report from the United States Consul at Harbin states that a government committee, in a two weeks' session at Harbin, sold 40,000 small farms in Heilung-Chiang Province to immigrants, at a total cost to the purchaser of $2.22 per acre.

[3] The Amur, the Sungari, the Yalu, and the Liao.

[4] According to the Daily Consular Reports for Nov. 18, 1911, the Antung-Mukden line was to have been open to traffic about Nov. 3, 1911, and the Changchun-Kirin line by the end of 1912. [Our readers are aware that both lines are now open.—Ed.]

[5] See Monthly Consular Reports No. 300, p. 93.

[6] In 1910, the total exports of bean products through Vladivostok, Dairen (Dalny), and Newchwang were: Beans, 920,266 tons (average price $14.50 per ton); bean-cake, 516,160 tons; bean-oil, 40,124 tons. In 1909, of $13,926,522 total foreign exports at Dalny, bean products accounted for $12,884,043. Exports to Japan were $8,302,533.

[7] Monthly Consular Reports, No. 319, p. 69.

[8] Imports of tobacco, especially in the form of cigarettes, have increased immensely within the last few years, probably because of the curtailment of the supply of opium.

and 1904 amounted to about five million dollars annually.[9] By far the most important commodities in this trade were cotton piece goods.

In 1901, out of a total of $24,813,692 native and foreign imports at Newchwang, $14,660,000 represented cotton products, and of this about one-third was native Chinese textiles, one-third American piece goods, and the rest chiefly imports of yarn from India, Great Britain, Japan, and China.

In 1902, about thirty-five per cent. of the total foreign imports at Newchwang came from the United States, and the greater part of this was cotton goods.

In 1903, the total foreign imports were $13,314,012, and America's share was $5,562,255, of which $4,873,960 was cotton goods. These figures will suffice to show the position held by the United States in former years in regard to the most important import of Manchuria.[10] The balance of the goods from America consisted chiefly of flour and kerosene, for each of which Manchuria offered a very important and continually expanding market.

Between 1901 and 1904, American commerce suffered considerably from the policy of Russia. This power had always exercised great influence in Manchuria, and she had, under various pretexts, finally established a measure of military control over the provinces. When she leased the Liaotung Peninsula in 1898, and opened Dalny as a free port, she blocked the establishment of a Chinese customs house there until July, 1903. In 1901, as a result of the Boxer uprising, she occupied Newchwang. The same year, the Chinese Eastern Railway was opened to traffic, under her control.

By discrimination in rates, and by preventing the collection of customs duties at Dalny, she attempted to divert to that port, where her own merchants were established, the trade formerly enjoyed by Newchwang, which was the base of the commerce carried on in Manchuria by other foreign countries. She also took measures to increase her own imports to the provinces. Fourteen steamers, subsidized to the amount of $309,000 annually,[11] were put in operation between European Russia and Vladivostok, Port Arthur and Dalny; and the Russo-Chinese Bank advanced large sums to Chinese merchants for the purchase of Russian goods. The same bank established a commercial branch to sell Russian oil and sugar. While other foreigners were still excluded from the interior, Russian subjects were to be found everywhere, building flour mills, meat packing establishments, and factories, opening mines, and selling Russian goods. Harbin, founded by the railroad company in 1896, had a European population of 60,000 in 1904, and other Russian settlements increased rapidly in size.

American Flour and Oil Suffer.

This policy, however, was not entirely successful. Russian trade was stimulated, but it by no means drove out that of other nations. American cotton goods were imported in as great quantities as before, although the Russian government was exerting every effort to supplant them by the product of Russian mills, and the volume of American trade thus remained nearly the same.

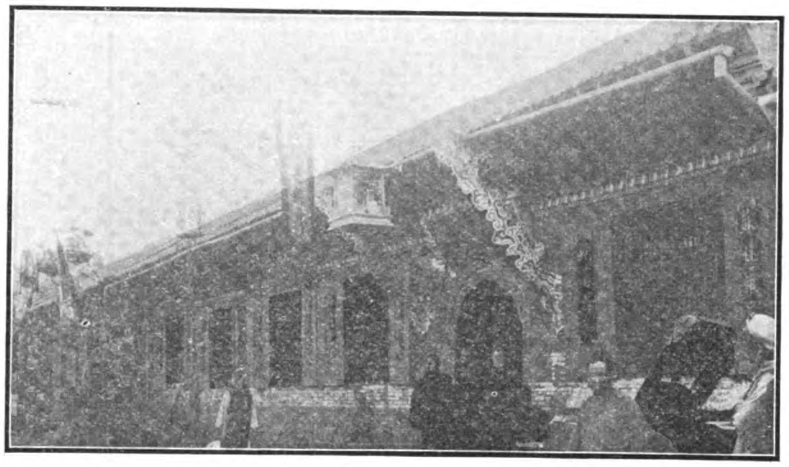
Nevertheless, because of the competition of Russian oil imported duty free at Dalny and carried at low rates on the railroad, the importation of American kerosene at Newchwang fell from 3,172,000 gallons in 1901, to 603,180 gallons in 1902; and American flour was almost driven from the market by the product of the Russian mills near Harbin. But these articles made up only a small part of the total trade.

Russia's control of the railroad was not so great an advantage as it seemed, since the cost of transporting bulky freight on it was prohibitive, and thus it was not nearly so effective a means of distribution in the interior as were the junks on the Liao River at Newchwang. It had already become evident that Russia could not hope to monopolize the commerce of Manchuria without a more serious disregard of the "open door" than she had yet shown, when the war with Japan drove her out of the southern province and confined her influence to the sparsely settled North.

America's Leadership Lost.

After the restoration of peace, American trade in Manchuria seemed to have a clear field. The subsidized Russian lines to Port Arthur and Dalny had disappeared, and the disorganized condition of the country had caused the flour mills in the North to close, so that American flour was in greater demand than ever before. American kerosene was in full control of the market, and American cotton goods seemed to have no important competitor, for over $9,000,000 worth were imported into Manchuria in the year 1905.

The year after the war was one of unprecedented commercial activity. There followed, however, a period of depression. Foreign imports at Newchwang decreased by one-half in 1906, and decreased further in 1907. This was due partly to the fact that Dalny was again without a customs house, but chiefly to the disastrous effects of the war on the interior.



A Tea Hong at Mukden

In 1908, a healthy revival set in, and the total imports increased steadily throughout Manchuria, especially with the opening of Antung, Mukden, and the important cities of the North. American trade, however, improved but little and soon began to fall off.

In 1908 and 1909, American consuls reported serious decreases in the amount of goods coming from the United States.

In 1910, our imports had fallen to a comparatively insignificant figure, and our trade in cotton goods, that is, the great bulk of all our trade, had largely passed into foreign hands. Our position of leadership in the Manchurian market was lost.

Rise of Japanese Commerce.

The nation which almost alone profited by this immense decline in American trade was Japan. In order to explain the great commercial advance of this power in Manchuria, it is necessary to sketch briefly the history of her systematic attempts to secure markets there for her products.

In the first place, Japan's geographical location gives her a decided advantage over Western nations competing with her for Manchurian trade. She is far nearer to China than any of her rivals, and is thus able to maintain regular, efficient, and cheap transportation with all of the ports in Shenking Province and with Vladivostok, where many goods are imported for use in the North. Her ownership of Korea makes it possible for her to send quick freight from Tokio to Harbin almost all the way by rail, over the Korean railroad and the Antung-Mukden line. She has a further advantage in her practical monopoly of the foreign export trade of the provinces, since a firm in China which does not do exporting as well as importing is exposed to serious financial difficulties from the variations in the rate of exchange.

Japan has not only made the most of her natural advantages in order to secure for herself the trade of Manchuria, but she has also taken extraordinary measures to assist her exporters. She had always enjoyed the greater part of the shipping and a fair share of the commerce of the provinces, but even before her war with Russia ended, it became evident that she intended to take advantage of her military occupation of the country to establish her trade still more firmly.[12]

Pushing Japanese Interests.

Great quantities of goods were sent into the interior, and after the conclusion of peace, the transports which carried the army home made their return trips profitable by bringing thousands of immigrants, who established themselves everywhere as farmers and merchants. While these merchants were doing an excellent business, foreign traders were rigorously excluded from the interior on the ground that military secrets were involved.[13]

It was asserted that the Japanese, supported by their troops, refused to pay the likin dues to which the goods of other nationalities were subjected, and further that they seized all of the desirable land in the cities which, according to treaty provisions, were soon to be opened to foreign trade.[14] All concessions obtained orclaimed by the Russians were taken over by the Japanese as a matter of course.

In the summer of 1906, a great industrial and commercial exposition was held at Mukden to promote interest in Japanese products, and similar expositions were subsequently organized in other cities. Great quantities of Japanese goods were brought in duty-free at Dalny and over th Korean boundary, while other foreign goods were going through the customs house at Newchwang.[15] These conditions were ameliorated with the gradual opening of the interior in 1906 and 1907, and comparative equality of opportunity was again restored when customs houses at Dalny, Antung and Tatungkou, ports which had formerly been under Japanese control, were established on July 1, 1907.

Equality of opportunity, however, could not be said to exist. Japan still retained control of the railroad, and, to a certain extent, of the financial system. By means of the railroad, she attempted to divert the trade of Newchwang to Dalny, or Dairen, as it is now officially called, by discriminatory rates, much as Russia had done. This policy has undoubtedly increased the commercial importance of the latter, although the former is still the chief port of entry. Japan also retained a certain amount of control over the currency of the provinces, which gave her banks an opportunity practically to regulate

[9] The figures given here are taken from the reports of United States Consuls, who secured them from the reports of the Native and Imperial Maritime Customs. As there has been almost no period since 1900 when there have been customs houses at all the ports of entry in Manchuria, such statistics must be considered rather as comparative than as exact.

[10] In addition to the trade at Newchwang, there was also a certain amount at Dalny, but no statistics are available for this because the customs house was not established there until July, 1903.

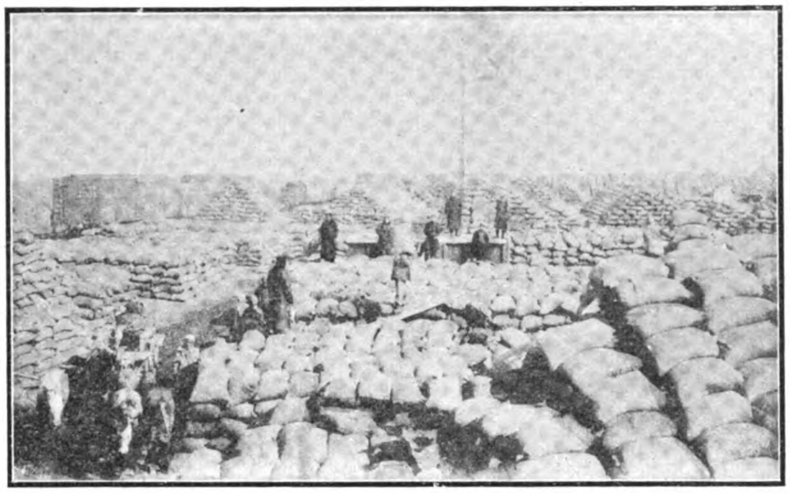
[11] S.U. Consular Reports, Vol. 73, p. 49.

[12] See the report of Special Agent Crist, in Monthly Consular Reports, No. 301.

[13] The United States Foreign Relations for 1906 record numerous complaints from American merchants who were not allowed to go into the interior to look after their property and interests.

[14] In 1906, the Chinese government had great difficulty in finding a site for the customs house at Antung, because the Japanese had taken possession of all of the land on the river front. See Foreign Relations for 1906, p. 221.

[15] In 1907, it was estimated that Japanese imports to Manchuria in 1906 amounted to over $12,000,000, of which less than $1,500,000 paid duty at Newchwang.



Beans awaiting Transportation at Changchun.

the rate of exchange. During the war with Russia, Manchuria had been flooded with Japanese "war notes," which were called in after the conclusion of peace and exchanged for notes issued by the Yokohama Specie Bank. These made up a large part of the currency, especially in Shenking, and were naturally a great aid in establishing a strong Japanese banking system.

When Manchuria was finally re-opened to foreign trade, Japanese products had secured a firm footing in the interior. Foreign merchants believed that this would be lost with the removal of the extraordinary advantages conferred by military occupation, but it soon became evident that even with the "open door" Japan was now a very dangerous competitor. The imperial government and the great business interests of the country united in a systematic attempt to get control of the import as well as the export trade of Japan's new "sphere of influence," as a part of their general scheme for national economic and industrial development. The liberal and progressive element, which was in complete political control after leading the nation to victory over Russia, extended the time-honored system of economic paternalism and did everything in its power to promote the national industrial prosperity. The railways were already owned by the government, and the steamship lines were controlled through large subsidies. Manufactures were encouraged, and where an industry was injured by competition a trust was formed and placed under government supervision. For the surplus manufacturing products, and especially for those of the cotton mills, Manchuria offered an excellent outlet, if the United States could only be ousted from its commercial leadership there. The government and the manufacturers accordingly turned their attention to this task.

Ousting Western Products.

On May 30, 1906, the *Jiji Shimpo* announced that several large Japanese spinning and weaving companies had united in the Manchurian Export Guild to advance their common interests and to export their goods under a common trade-mark.

The Mitsui Bussan Kaisha, the leading commercial house of Japan, was to act as the general agent of this guild in Manchuria, and the Yokohama Specie Bank and other institutions were to loan money at 4½ per cent to merchants doing business there to enable them to purchase Japanese goods. The government guaranteed these loans, and also secured favourable rates on the railroads and on the subsidized steamship lines.

In Manchuria itself, permanent representatives were appointed at all important towns, and travelling salesmen, well equipped with samples of goods and speaking Chinese fluently, were sent throughout the country. The consuls in the Eastern provinces offered every possible assistance, and the manufacturers at home carefully followed their suggestions.

In addition commercial students, paid by the government, and under the direction of the nearest consul, studied the trade condtiion in each locality, and their reports enabled the export houses to work more intelligently than was possible for those of other nations.

In Japan itself, the mills steadily endeavored to improve the quality of their output, which was at first of a very inferior grade, and finally succeeded in making it nearly as good as, while far cheaper than, similar Western products.

Ascendancy of Japan's Trade

This policy has met with remarkable success, In spite of the ingrained respect of Chinese merchants for long established trade-marks, and in spite of the intense unpopularity of Japanese goods caused by the dispute over the seizure of the steamer Tatsu Maru in 1908, and by the resentment among the Chinese at the Japanese policy in Manchuria itself, the imports of cotton goods from the Island Empire have now taken the leading place in the Manchurian market.[16]

The methods used to attain this position have been severely criticised. The counterfeiting of trade-marks, in particular, has caused much bitterness on the part of Western merchants, and strenuous efforts have been made to secure adequate protection against this practice. In 1904, in accordance with her treaty obligations, China adopted a series of regulations for this purpose, which have proved entirely inadequate. In the following years, the United States made agreements with numerous powers for mutual protection by means of the consular courts in China, but Japan did not enter into such a compact. Trade-marks are of even more importance in China than in occidental countries, because the Chinese consumer always endeavors to secure the brand he has been accustomed to use, recognizing it by the trade-mark.

The decline of American trade in Manchuria is due primarily to Japanese competition, but the development of the native Chinese industries is a factor that should not be overlooked. The trade in native goods profited greatly from the steady decline in the value of silver which set in after the war, since this made the silver prices of foreign articles, which were manufactured by laborers paid in gold, much higher than those of goods made by laborers who still received their customary wages in silver.

Chinese cotton goods, manufactured chiefly at Shanghai, have been gaining in popularity in Manchuria for at least ten years, since they are low-priced and are said to be of durable quality. The once large importations of American flour had already ceased before the war. After the war the mills in the North were unable to distribute their products in the South because of the destruction of part of the railroad, and great quantities of American flour were brought in. This importation practically ceased with the withdrawal of the army and the rebuilding of the railroad, and American flour is not now seen in Manchuria.

Where American Manufacturers Failed

The competition of Japanese and native commerce was indeed formidable, but it could never have overcome the established reputation and popularity of American goods in so short a period if the exporters of the United States had made any intelligent effort to retain their hold on the Manchurian market.

The one real fundamental cause of the decline in our trade has been the way in which it has been handled.

In the first place, there has never been any regular direct steamer communication between our ports and those of Manchuria, although the volume of our trade and the great saving in the cost of transhipment would make such a service very valuable.

Our goods have generally gone to Shanghai, and have been imported into Manchuria from there largely by Chinese merchants or by firms of other nationalities, that is, the sale of our products has been in the hands of our commercial rivals.[17]

In the second place, American exporters seem to have paid no attention to the suggestions of consuls at Manchurian ports as to the peculiar requirements of the Manchurian market. Instead of sending samples of goods, which are an absolute necessity there, as a Chinaman will not buy wares which he has not seen, they have sent catalogues in English, which are entirely unintelligible to most of the merchants whom it is necessary to reach.

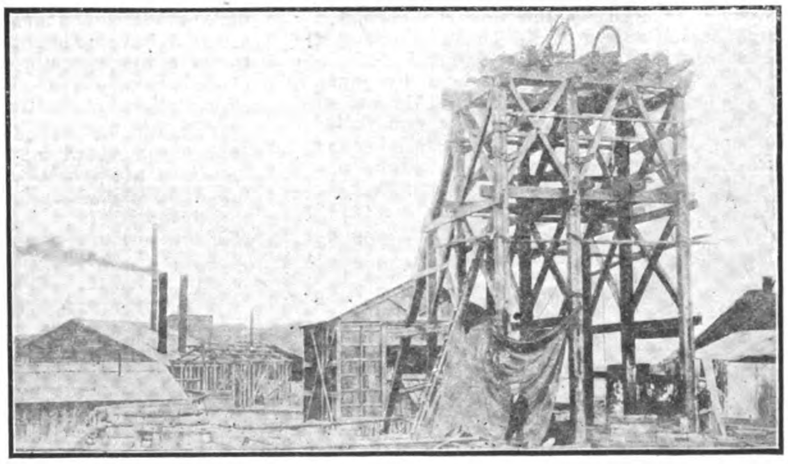
Complaints are constantly heard of carelessness in packing and in sending shipments.

Little effort, moreover, has been made to develop the great opportunities which Manchuria offers for the extension of trade into new lines, although the Consular Reports for the last decade have been full of suggestions regarding such possibilities. In short, the former American leadership in this trade has gone practically by default, because of the incompetence and carelessness of American exporters.

The present commercial position of the United States in Manchuria may be summarized as follows:

16 In 1904, according to the *Jiji Shimpo* (quoted in U. S. Foreign Relations for 1906), the imports of sheetings and drills from Japan at Newchwang and Dalny were valued at only $18,206, as compared with $5,347,900 worth from the United States. The change effected by Japan's policy is striking.

17 In 1905, when our trade in Manchuria reached its highed point, there were three American business houses there, out of a total of 143 foreign establishments. (Monthly Consular Reports, No. 306, p. 90.) In 1907, American trade was largely handled by the firm which was also agent for the Japanese-Manchurian Export Guild, and by a German firm. (Monthly Consular Reports, No 318, p 102.



The Coal Mine at Fushun

Imports are practically confined to cotton goods, kerosene and tobacco, of which cotton goods are still the most important, although they have seriously decreased within the last three years.[18]

Our trade in kerosene and in tobacco, especially cigarettes, is still prosperous because these have been sold by aggressive and intelligent companies which have followed the same methods as are employed by Japanese firms in extending their trade.

The Standard Oil Company is far ahead of its competitors from Sumatra, Russia and Borneo, and in 1910 over ten million gallons of American kerosene were imported out of a total of not quite fifteen million.

The British-American Tobacco Company, which is practically an American concern, has been able to compete with no little success against the products of the Japanese government monopoly, largely because its factories are located at Shanghai, so that it has the advantages of direct transportation and of cheap Oriental labor. Each of the firms has an effective selling organization in the interior.

With the exception of these two lines, however, our trade is at present either gone or rapidly disappearing.

Japan's Present Policy

How much chance will there be in the future for American trade to regain its former position in Manchuria? The answer to this question will depend largely on the respect shown by Japan for the "open door," the principle of equal opportiunty for the commerce and industry of all nations. At the present time, it seems probable that the Mikado's government will continue to respect this principle, both from necessity and from regard for its own interests.

In the first place, it is not likely that Japan will be able to acquire more extensive political control over the Eastern Provinces than she already enjoys. Japanese immigration to Manchuria has not been large, because, as a close student of Chinese conditions has pointed out, her immigrants have never been able to compete with the native stock either as merchants or as farmers.[19] The country will remain distinctly Chinese, and any outside control must take the form of domination rather than of absorption. Moreover, any attempt seriously to interfere with foreign trade would bring on the active hostility of all the other powers which are important in Eastern affairs, and especially that of the United States and Great Britain, whose friendship Japan could not afford to lose. These powers, even if they did not consider their own commerce, would not tolerate any interference with the tariff or with the trade on which the amount of the duties levied depends because of their interest in the Chinese debt, which is secured by the customs revenues. China herself, also, would be an insuperable obstacle to Japanese political control in Manchuria. The concessions now held by Japan for the most part revert to China at the end of varying periods, and in view of the remarkable national development of the Celestial Empire during the last few years, it seems probable that she will be able to insist on and secure her rights when these periods expire.

[18] In 1905, the United States practically monopolized the trade in piece goods. The number of pieces of drills, jeans, and sheetings imported into Manchuria during the last two years was, however, as follows:

	Drills		Jeans		Sheetings	
	1909	1910	1909	1910	1909	1910
American ...	319,4?8	186,698	98,111	3,968	706,735	378,121
Japanese ...	114,814	252,342	....	....	261,743	694,574
British	12,359	6,750	278,258	323,246	69,953	15,231

These figures, given in the Daily Consular Reports for Nov. 18, 1911, clearly show the gains made by Japan in the import of these wares.

[19] J. W. Jenks in the *Outlook*, March 11, 1911.

Acceptance of the Open Door

Moreover, even if Japan were able to shut out the commerce of other nations from Manchuria, it would not be to her interest to do so. Her geographical advantages alone enable her to control a large share of the trade in commodities which she produces, and the increased prosperity which the general commercial development of the country will carry with it must, in the long run, be favorable to Japanese exporters.

The few American merchants who have shown sufficient interest in Manchuria to send their goods to the commercial expositions, held by the Japanese at all of the important distributing points, report that they were treated with courtesy and that their goods were well exhibited at very reasonable charges. It must also be considered that Japanese capital can never suffice for the development of the great concessions of which Japan took possession after the war. For the sake of these, foreign capital must be attracted to the country, and this can only be done by the frank acceptance of the "open door" policy.

The actions of Japan which have recently given rise to thenumerous accusations that she intended to do away with the open door in Manchuria, may generally be ascribed, not so muchto a desire to injure foreign commerical interests as to a determination to maintain the value of her own concessions. For instance, the opposition to China's attempts to build the Hsinmintun-Fakumen railroadinto the interior has arisen from a fear that this line would compete with the Japanese-owned Southern Manchurian line and would also draw trade away from the Japanese port of Dairen, or Dalny.

Sacking Beans at Changchun

The indirect attempts to injure the commerce of Newchwang are due to a desire to make Dairen more prosperous. Whatever the secondary effects of Japan's policy may be, she seems to have no intention, at present, of trying to stifle foreign enterprise, and where foreign trade is being driven out, it is not by a system of exclusion but by strenuous competition.

It should be remembered, moreover, that Japan's sphere of influence covers only about one-third of Manchuria. The two-thirds still under the influence of Russia is, it is true, less thickly populated and less important commercially, but a large immigration is constantly increasing its value as a market, and it is said to be fully as fertile as the southern region.

Without some radical violation of the open door principle, however, which will be as difficult for her as for Japan, Russia's commercial rivalry will not be formidable here. The cost of bringing bulky goods from Europe on the railroad is prohibitive, and goods brought by sea must come through Vladivostok, which is closed by ice part of the year, or through the southern ports and from there into the interior on the Japanese railway. In either case, the sea route from European Russia is longer and more expensive than that from the United States. Japanese trade has already secured a foothold north of Changchun, and no doubt properly handled American trade could do the same.

It seems probable, then, that in the future Manchuria will be open to the commerce of all nations on equal terms.

American Methods Must Change.

There is no reason why American exporters, by adopting a new policy, should not be able to increase greatly the sale of our products there, if they will only make an effort to do so. American banks should be established in the principal Manchurian trade centers and Manchurian products should be brought direct to the United States.

A considerable amount of Manchurian bean-oil is now used here, but it is imported from Europe, after being expressed there.[20] In addition, an efficient method should be adopted for selling goods after they have reached the Eastern Provinces.

In dealing with Chinese merchants, personal relations by means of local agents are necessary, and samples of wares should be used rather than catalogues written in English.

If a really effective policy were adopted, soon we should again be sending large quantities of goods to Manchuria.

Even though our cotton products were unable to compete with the government-aided output of Japanese mills, we could still sell machinery of all kinds, and stoves, shoes, condensed milk, and countless other manufactures for which a demand exists or will soon exist in the Manchurian market. We could thus always have a fair share in this trade, whereas at present the amount of American goods imported grows smaller each year.

It would be a great misfortune for American industry if we should lose entirely our part in this already great and rapidly growing trade; and if this is to be avoided, an active policy of developing our Manchurian commerce must be inaugurated at once.

[20] Under the Payne-Aldrich tariff the duty on beans is 45 cents per bushel of 60 pounds, which is nearly 100 per cent in the case of Manchurian beans. This naturally would prevent their importation into this country. The duty on expressed oils is only 25 per cent.

ENTERPRISES IN MANCHURIA.

Much has been done toward the development of South Manchuria since the Chinese Eastern Railway was transferred to the control of Japanese authorities, says the *China Tribune*, a Japanese weekly newspaper published at Tientsin. Prior to the outbreak of hostilities between Russia and Japan no enterprise worth mentioning existed in that region, but now factories are built in almost all large cities found in the district within the sphere of Japanese influence. The following are a few of the enterprises now under operation in South Manchuria:—

China-Japan Match Co., Ltd.

Location—Changchun.

Capital—Y 30,000, invested by Japanese and Chinese at the ratio of 9 Japanese to one Chinese.

Management—Under the sole control of Japanese; very good result is being attained.

Output—150 cases a day (working only during day.)

Distribution—40% of the output is consumed in Changchun, and the balance is

Beans Awaiting Transportation at Changchun

shipped to Nungan, Kirin and other districts.
Dividend—15% per annum.

HSINTAI KUNGSSU

Organized—In the fall of 1910.
Capital—Nominally half a million yen; the amount paid up, Y 125,000.
Location—Changchun.
Object—Manufacture of bean-cake.
Organization—Joint stock company made up of Chinese and Japanese.
Machinery—A steam engine of 70 horse power and two boilers.
Output—2,500 piculs of bean-cake per day (working day and night).
Management—The company, beside manufacturing beancake, deals in the transaction of beans during the bean season; its business result is splendid.

TIEHLING FLOUR MILL.

Organized—In December, 1909.
Capital—Nominally one million yen; paid up half a million yen.
Location—Tiehling.
Output—Maximum manufacturing power is 1,600 sacks in 24 hours.
Business Prospects—Owing to the sudden rise in price of kaoliang, the daily food of the Chinese in Manchuria, the demand for flour increased. This together with the failure of the wheat crop in North Manchuria, forcing the Harbin Flour Mill under the management of Russians to raise the price of its product, placed the company in a very favorable condition, with the result that a branch mill is being established at Changchun.

THE CHANGCHUN BRANCH MILL.

The Building—In course of construction, with the prospect of operating during this spring.
Plan—It is on a much larger scale than the main factory at Changchun. The site of the mill comprises 4,800 sq. ft. The machinery will be operated by electric current furnished by the South Manchuria Railway Power House at Changchun.

KWANGI KUNGSSU

Organized—In March, 1911.
Location—Mukden.
Capital—Three million dollars.
Object—To manufacture sheetings.
Organization—A limited partnership of four Chinese.
Machinery—Thirty looms manufactured at Nagoya, Japan; the motive power is furnished by a kerosene engine.
Mill-hands—Forty-five men, salaries ranginr from seven to twenty dollars peg month.
Output—Thirty pieces per day, a piece measuring forty yards.
Yarn—Furnished by Mitsui Bussan.
Business Prospects—Owing to the prevailing high price of cotton yarn, the company is unable to realize anticipated profit, but when strict attention is paid the opportunity to purchase yarn, a better result may be obtained.

ANGLO-AMERICAN TOBACCO FACTORY

Established—In the spring of 1908.
Location—Mukden, outside of Small West Gate.
Amount Invested—Y 120,000.
Hands Employed—About three hundred Chinese.
Occupation—It purchases leaf tobacco produced in Manchuria, and compressing them, ships to the cigarette factories at Shanghai and Hankow, beside manufacturing cigarettes.
Business Outlook—Although the cigarettes manufactured at the Hankow and Shanghai factories constitute about 6% of the total consumption in Mukden, the business outlook of the company here is not very bright.

SANLIN KUNGSSU

Established—In 1906.
Location—Mukden.
Capital—Twenty thousand dollars.
Object—To manufacture cigarettes for Chinese demand.
Hands Employed—Over fifty Chinese.
Output—About eighty thousand dollars in value per annum.
Management—Under the control of a Japanese called Iwaya. The supply being insufficient for growing demand, the extension of the factory is being contemplated.

SENYANG HORSE CAR CO.

Location—Mukden.
Capital—$190,000, invested by Okura & Co. and Chinese at the ratio of 4 to 6.
Object—To operate a horse car line for three miles between the railway station and Small West Gate.
Business Outlook—The company clears a profit of 15,000 to 16,000 dollars a year.

HOZUMI GLASS FACTORY

Organized—In June, 1906.
Location—Mukden.
Capital—Y. 25,000.
Object—To manufacture glass-ware for Chinese demand.
Hands Employed—Twelve Japanese and thirty-two Chinese.
Output—Annual product amounting in value to 35,000 dollars.
Business Outlook—Owing to the advancement of taste among the Chinese since the revolution, demand for glassware has considerably increased. The company has a very bright future before it.

GOVERNMENT MANUAL TRAINING INSTITUTION

Established—In August, 1909.
Location—Mukden.
Amount Invested—Tls. 30,000 for building, Tls. 20,000 for machinery andmaterials, beside twenty thousand taels for annual running expenses.
Object—To teach Chinese weaving, carpentry, dying, embroidery, manufacturing lacquer ware, hard ware, carpets, and leather.
No. of Men to be allowed—Five hundred in all, three hundred of whom to be trained at government expense.

TAICHANG KUNGSSU

Established—In 1910.
Location—Liaoyang.
Capital—$ 20,000.
Object—Manufacturing cotton piece goods.
Hands Employed—Over forty men.
Dividend—The year before last, a dividend of 20% was declared.

SAMTAI YUFANG

Established—In May, 1907.
Location—Main factory at Yingkow with a branch at Dairen.
Capital—Half a million yen.
Organization—A joint-stock company of Chinese and Japanese.
Object—Manufacture and sale of bean cake and bean oil, beside engaging in the transaction of other cereals.

ODERA OIL FACTORY

Established—In 1905.
Capital—One million yen.
Object—Manufacture of bean oil and bean cake.
Dairen Branch—Opened in 1910 and engages exclusively in the exportation of bean oil to Europe.

YINGKOW WATER AND ELECTRIC CO., LTD.

Established—In November, 1906.
Location—Yingkow.
Capital—Two million yen, invested by Chinese and Japanese.
Object—To supply water and electric light in Yingkow, whilst engaging in transport business.
Business Result—Owing to the dissatisfaction of Chinese shareholders, the management has been turned over to the South Manchuria Railway Co.

EAST ASIA TOBACCO CO.

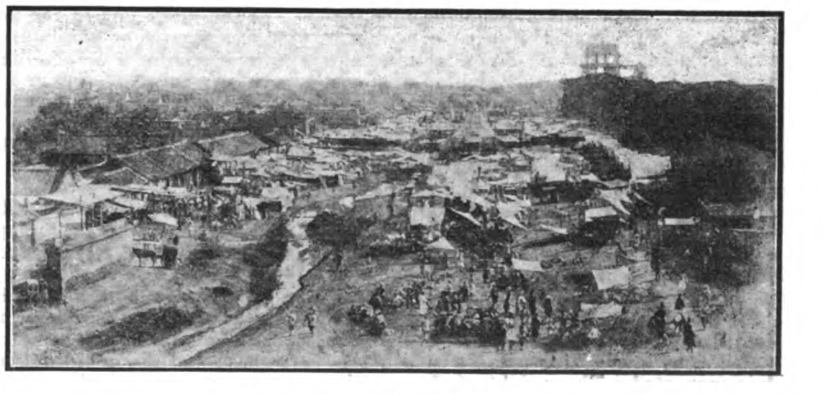
Established—In November, 1906.
Location—Yingkow.
Capital—One million yen.
Hands Employed—Nearly eight hundred Chinese and Japanese.

SINO-JAPANESE BEAN CAKE FACTORY

Established—April, 1907.
Location—Dairen.
Capital—Three million yen.

ONODA CEMENT WORKS

Established—April, 1909.
Location—Dairen.
Capital—Yen 1,200,000.
Business Outlook—The company has a very bright future.



Panoramic View of Mukden

KOJIMA ICE FACTORY

History—At first, the factory engaged mainly in the business of cold storage by using natural ice, which was started in 1908. Three years later it commenced to manufacture artificial ice.

Business Outlook—Owing to keen competition among persons engaged in similar business. the concern is unable to realize any profit. This condition may last for some years to come.

SHOYU (JAPANESE SAUCE) BREWERY

Established—June, 1909.
Location—Port Arthur.
Capital—Y 25,000.
Output—During the year 1911, it produced 20,000 koku of the Japanese sauce, amounting in value to forty thousand yen.
Market—65% of the consumers live outside of the Leased Territory, where the balance is consumed,

JIHHSING FUFANG

Established—April, 1910.
Location—Antung.
Capital—Y 80,000.
Object—Manufacture of bean cake.
Output—During the year before last, the factory turned out 360,000 piculs of bean cake and 1,800,000 catties of oil

ANTUNG OIL FACTORY

It is an undertaking of Japanese residing in Antung to manufacture bean oil and been cake with a capital of fifty thousand yen. As the capital has been subscribed the construction of the factory will be soon started.

YALU LUMBER CO.

It is a concern organized by Japanese, and he work shops are under construction at the expenset of sixty thousand yen, which are expected to be completed in August,

In some interesting daylight tests recently made at the Awanui high-power wireless station, by the Telefunken engineers, communication was held with Pennant Hills station (Sydney), distant about 1,400 nautical miles, daily between 11 a.m. and 1 p.m., every word being clearly heard. The effect of the Antarctic "dark days" on the electrical waves is to be investigated at Awanui, now Dr. Mawson's Adelie Land station is in operation. Night messages have been successfully passed from Awanui to stations 4,800 miles distant.

Nine electric locomotives of 1,400 horse-power normal rating and capable of being overloaded up to 5,000 horse-power, have been ordered by the New York Central Railroad Company. They are claimed to be the most powerful locomotives yet constructed. The tractive effort will enable a 1,000-ton train to attain 60 miles per hour. The type of construction adopted is that having a motorman's compartment at either end with contactor gear, resistances, brake compressors, &c., housed midway in a central compartment. The coach is supported upon the centre pins of the two portions of an articulated frame, each portion running on two fixed axle trucks. The motors, which are eight in number, one to each axle, have a continuous rating of 260 ampères at 600 volts under forced ventilation, and 325 ampères for periods of one hour, the current being collected by eight under-running third-rail shoes. Two pantagraph type overhead trolleys are also fitted for use on sections where the third rail is nolt installed, these being operated from the motorman's compartment by foot lever control pneumatic gear. The forced ventilation for the motors is obtained from compressors, the air being driven through the box form type of girder and down through the hollow centre pins on which the coach is supported. The weight of the cars is 100 tons, and the entire length of frame 22ft.

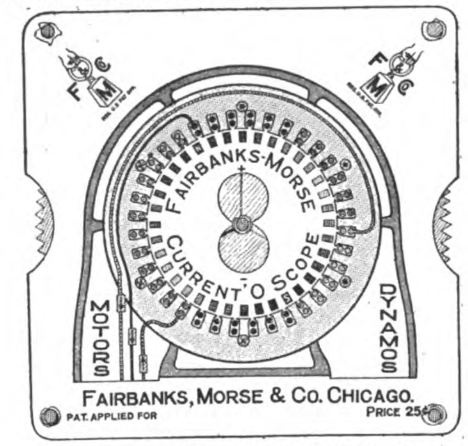
REVOLVING FIELD OF ALTERNATING CURRENT MECHANICALLY ILLUSTRATED

The Fairbanks-Morse Gurrent'o Scope shows in a simple and correct manner, how the so-called revolving field is produced by the action of alternating currents in a three phase alternating current induction motor.

An alternating current is one whose direction of flow is reversed periodically so that it flows first in one direction for a brief period and then gradually decreases in strength, reaches zero, starts to flow in the opposite direction and gradually increases in strength until it has the same value as before in the opposite direction and then these processes are repeated.

In a 60-cycle current the reversals occur at the rate of 120 per second; in a 25-cycle current they occur at the rate of 50 per second; two reversals for each cycle.

A three phase alternating current is really three alternating currents usually flowing in three wires, the reversals following each other in the three wires at equal intervals of time always in the same order.



In the center of the Current'o Scope there will be seen through the two circular openings, three radial lines which represent the relative direction and flow of the electric currents in phases 1, 2 and 3 of a three phase generator, or transmission line, or motor. For convenience, we will refer to them as black, green and red currents in black, green and red phases. When a line appears in the upper circle it indicates a current in the positive direction in that phase and a line in the lower circle indicates a current in the negative direction. The length of the line as they show through the circular holes indicates the strength of the current in amperes, which it must be remembered is constantly changing.

Turn the disc until the black line points vertically upward in the upper circle; this represents a current of maximum value flowing in the positive direction in the black phase.

Turn the disc left handed, or opposite to the motions of the hands of a clock, and notice that the black current decreases gradually, becomes zero, then reverses and starts in the negative direction, as shown by the appearance of the black line in the lower circle, gradually increases to its maximum negative value when the black line is vertical, decreases again to zero, changes to positive and gradually increases until it reaches its maximum positive value again when the black line is vertical. The red and green lines will be seen to pass through similar changes, following each other one-third of a revolution apart.

Again turn the disc until the black line points vertically upward in the upper circle; the black current is now at its maximum value in the positive direction and the green and red currents are exactly half of the black current, in the negative direction. This may be looked upon as a current flowing inward through the black phase and diving into two equal parts which return outward through the green and red phases.

Turn the disc in a direction opposite to the movement of the hands of a clock and note that the black current decreases, the green current increases and the red current decreases. After moving the disc 30 degress, it will be noticed that the decreasing black current and the increasing green current have reached the same value and the red current has disappeared. At this time there is no current in the red phase and all the current is flowing in through the black phase and out through the green.

Turn the disc still farther in the same direction and the black current will go on decreasing while the green current increases until after moving 30 degress the green line extends vertically downward indicating that the green current has reached its maximum value in the negative direction, while the red current has reversed and is now flowing in the positive direction, as shown by the red line in the upper circle, and both the red and black positive currents are each equal to one-half of the green negative current. This condition may be looked upon as two equal currents flowing in through the red and black phases and joining together to flow out through the green phase.

Turn a little farther; the black and green currents decrease and the red current increases until after turning 30 degress more the green negative current and the red positive current are equal and the black current has disappeared. Turn a little farther; the black current has reversed and is now flowing in the negative direction and after moving 30 degress the red current has reached its maximum positive value and the black and green are both negative and each equal to one-half of the red

Turning 30 degrees more, it will be seen that the green current has disappeared, the black negative current is equal to the red positive current. 30 degress farther on, the black current has reached its maximum value in the negative direction while the green and red are positive and equal to one-half of the black. This is exactly opposite to the condition with which we started when the black line was vertical.

Turning farther by steps of 30 degrees, we observe the following changes in order: First, red current zero, black and green currents equal; second, green current maximum in the positive direction, red and black currents each equal to one-half the green in the negative direction; third, black current zero, red and green currents equal; fourth, maximum negative value of red current, black and green positive currents each equal to one-half of the red; fifth, green current zero, black and red currents equal; sixth, maximum positive value of black current, red and green negative currents each equal to one-half the black.

This brings us back to the same position with which we started, completes one cycle and represents the changes which the three currents pass through sixty times a second in the case of a sixty cycle current.

If the disc is turned again watching one line at a time, it will be seen that each current in turn decreases from a positive maximum to zero and increases from zero to a negative maximum, then decreases and passes throngh zero again and increases to a positive maximum.

The outer part of the diagram shows the frame, core and windings of a two-pole three phase induction motor; the pale green slotted ring represents the stator core and the red, green and black spots represent the wires in the stator slots; the red, green and black lines running around the core from the left hand foot of the motor indicate the lead wires through which the current flows to these windings and the other ends of the three windings may be assumed to be all joined together at the back of the motor. In a "star" wound motor they actually are joined.

The arrows which appear through the slots in the motor foot indicate the direction of the currents in the lead wires, while the spots and crosses which appear through the round holes in the stator frame indicate the direction of the currents in the phase windings opposite which they appear, the crosses indicating a current flowing downward or away from the observer and the points indicating currents flowing upward or toward the observer. Where a zero

appears in these holes, it indicates no current in that phase. The red and black shaded portions of the disc which show through the inner rectangular slots indicate the strength and direction of the magnetic field produced by the combination of the currents flowing in the different phases, the red indicating a north pole and the black a south pole. The deeper shaded portions where the letters N and S appear, indicate the points of maximum field strength, and the lighter shaded portions indicate the gradual weakening of the field on either of these points.

Placing the disc with the black line extending vertically upward through the opening at the center of the diagram and looking at the arrows through the openings in the motor foot, we see that the black current is flowing inward to the upper part of the black phase windings and from there downward to the back of the motor where it passes through the end connections of the coils to the opposite windings of the black phase at the bottom of the diagram. After passing through all the windings of the black phase to the point where the three phase windings are joined together, it then splits into two equal currents which flow outward through the red and green phases, passing downward through that part of these windings which lies above the horizontal line and upward through the parts lying below the horizontal line, as shown by the crosses and points back of the round openings.

In all the wires below a horizontal line through the center of the diagram, the points that show through the openings in the stator core indicate that the current is coming upward toward the observer, and above a horizontal line the crosses indicate that the current is going downward away from the observer. This is equivalent to right hand rotation of the current about the central part of the left hand inner surface of the stator core and consequently produces a south pole at that point, while looking at the opposite right hand surface the direction of rotation of the current would be left hand and copsequently a north pole would be produced at that point. The strength of the current in the black phase is at its maximum value and the strength of the red and green windings is equal, therefore, the total current strength above and below the horizontal line is the same and the poles or points of maximum field strength are located at the ends of the horizontal line.

Turning the disc in the left hand direction until the next series of marks appear through the openings, we see that the currents are all in the same direction as before, but the green current has increased in strength a little and the red current has decreased in strength a little, so that the total current strength is no longer symmetrical about a horizontal line but the green current in the windings above the line have strengthened and the red currents have weakened and below the line the red windings at the left have weakened while the green windings have strengthened, thus shifting the poles downward at the left and upward at the right.

Turning the disc another step, it will be seen that the current in the red phase has become very weak, while the green phase has gained still further in strength, thus shifting the poles still more. At the next step the red current has disappeared altogether and black and green currents are equal and it will be noticed that there are now two crosses in the two upper left hand openings through the stator core and two points in the two lower left hand openings and as the current in the red and black phases is equal the poles are formed at the ends of a line 30 degrees from the horizontal sloping upward to the right and passing through the center of the red phase. The next step shows an increase of the current in the green winding and a decrease in the black current with a very small red current now in the positive direction, all tending to shift the north pole a little to the left of the 30 degree line. At the next step the green current has almost reached its maximum value and the poles are still farther shifted in the same direction and at the next step the green maximum is reached and the poles will be found lying right upon the axis of the green winding and midway between the red and black.

It will be noted that whenever the current in one phase winding is at its maximum value the currents in the other other two phases co-öperate with it to produce a magnetic flux along its axis and when the currents in the two phases are equal with zero current in the third phase, it fluxes along the combined axis of the two current carrying phases. At intermediate points the action of the current is such as to produce a great shifting of the flux from one axis to the other.

As the disc is farther turned step by step, it will be noticed that these changes are repeated and that the poles are shifted continuously in the same direction, until when the black line is projecting vertically downward showing that the black current has reached its maximum value in the negative direction, the poles have made one-half of a revolution and the north pole is now at the left where the south pole was located when we started, and upon turning the disc until the black line projects vertically upward again completing one cycle for the current, it will be found that the poles have made one complete revolution, that is, for a two pole machine the revolving field makes one complete revolution for each cycle. For a four pole machine there would be four poles about the circumference of the core instead of two and the revolving field would advance from the initial position of another north pole or one-half of a revolution. For a six pole machine there would be one-third of a revolution for each cycle and so on, the number of revolutions being equal to the number of cycles divided by one-half the number of poles. As the frequency of an alternating current is given in cycles per second and the speed of the motor in revolutions per minute, it follows that the number of revolutions per minute is equal to 60 times the number of cycles divided by one-half the number of poles. This is the synchronous or no-load speed of the motor.

The rotor or revolving part of an induction motor, although made up of an iron core and a number of copper bars or group of coils, is dragged around by the revolving field exactly as a two pole magnet mounted upon the shaft would be, except that it lags slightly behind the speed of the revolving field by an amount corresponding to the load on the motor.

THE WORLD'S GOLD SUPPLY AND THE DEVELOPMENT OF THE EAST

One of the most marked features of economics in the past twenty years has been the triumph of gold over silver as a currency basis among all the most important countries of the world. This circumstance has been the outcome of many conditions—the growth of experience, the increased advantage to be looked for from the more general acceptance of the principle, and especially the assurance of a growing supply of gold itself. Now, however, that we are threatened, for a time at any rate, with a period of equilibrium, if not actual decline, in gold production, and we note an increasing adoption in hitherto purely silver using countries of a currency system which depends upon the immobilisation of large amounts of gold as a fixed reserve, the question of the extension of a gold based currency system throughout the world begins to offer problems of interest for a much wider circle than silver miners, the silver market and silver currency countries. These and cognate considerations invest with more than local interest the currency operations which are at present under consideration in India and China, and for that reason we propose to refer very briefly to the suggestions under consideration in both countries, which are, as our readers know, the two chief *foci* of the silver market.

It will be remembered that as a result of the report of the Indian Currency Committee in 1898 it was decided to adopt a Gold Exchange Standard for India, the rupee being fixed at 1s. 4d., or one-fifteenth of a sovereign; the mints were closed to the unrestricted coining of silver, and a gold reserve established in this country to maintain parity of the silver coinage at the rate fixed. Subsequently sovereigns and half-sovereigns were constituted legal tender in India under the Indian Act XXII of 1899. The change in the currency thus introduced has, we believe, given general satisfaction. The apprehensions entertained of possible difficulties do not appear to have been experienced in practice; the business uncertainties always experienced with a fluctuating exchange have practically disappeared, and, what is most important, the natural reluctance of European capitalists and investors to advance money to to a country where a large margin for possible capital depreciation and changes in returns had to be allowed for by reason of currency fluctuations has been removed. A further important change, which is believed to be taking place on a considerable scale, is the growth of confidence among the natives in the use of gold in its most primitive form as a medium for hoarding in place of silver, and to some slight extent in a more advanced form in an increasing confidence in the safety of depositing with banks, the security of which, of course, depends ultimately on the security they can command in terms of gold. While the results of the far-reaching change adopted in the currency of India have fully answered all expectations, it is worth noting, as evidence of the extent to which we are still feeling our way in the study of problems of the kind, that the full recommendations of the Currency Commission have not been carried out up to the present time. They advised that concurrently with the closing of the Indian mints to the unrestricted coinage of silver they should be open to the unrestricted coinage of gold. This has not yet been done, and the reason, as shown in a recently published Parliamentary paper containing a history of the subject up to the present date, is instructive from many points of view. From the first the Indian Government appear to have attached great importance to the establishment of a mint to coin English gold. while the authorities at home appear to have accepted the recommendations of the Commission on this point without reflection as to the difficulties which became evident in the course of negotiation. It is impossible here to do more than follow the history of the question in the barest outline. The question was referred to the Deputy Master of the Mint, who pointed out that under the India Coinage Act of 1870 the Governor-General had no power to coin sovereigns, but only certain India gold coins, such as the ten rupee piece, and that these coins were not legal tender. As for some reason it was deemed inadvisable to introduce fresh legislation on the subject in Parliament, it was decided to establish a branch of the Royal Mint at Bombay under a Prerogative Order in Council, as had been done in the case of the Australian mints. This necessity took the matter out of the hands of the India Office, and involved obtaining the sanction of the Lords of the Treasury, and, as it turned out, of the mint authorities in London, to whom their Lordships deferred for advice on technical matters. In the meantime, as no objection in principle was taken, a proclamation was duly drafted for the establishment of a branch of the Royal Mint in Bombay, and the issuance of a gold coinage of the values coined at the Royal Mint and its branches. There then ensued long negotiations between the Government of India, the India Office, the Treasury, and the Royal Mint and respective officials on points of detail connected with the equipment of the proposed mint, which deterred action from the autumn of 1899 to Christmas 1902, when the Government of India, having at last taken steps to inquire what gold was available from the Indian mines for minting purposes, and having learned that it was unlikely that the chief mining companies would alter their arrangements under which they regularly sold their gold to London, decided "to drop the scheme for the present, leaving its revival to

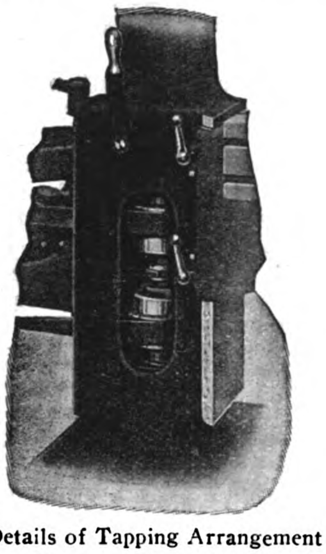
the existence or revival of conditions which cannot at present be foreseen." It appears from the official correspondence published that while the Treasury was not enamoured of the scheme, effective opposition came from the Mint, and was based, therefore, largely on technical considerations. The Deputy Master of the Royal Mint, Mr. Seymour, in reviewing the whole subject, pointed out that mints had been established in Australia solely as a convenience to the mining industry at a time when Australia was the centre of the world's gold production, and the facilities of disposing of and transporting gold were very different to what they are at the present time. He also pointed out that it was highly unlikely that there would be any gold available for the Bombay mint, save that produced in the local mines, which amounted in all to about £2,000,000 a year—an amount insufficient to secure even a mint on the small scale proposed more than three months, working. The result was that, when at length inquiries were made and it was discovered that even this supply could probably not be secured, the advisability of dropping the scheme became apparent even to the Indian Government. A little previous to this time, however, the Treasury, repenting apparently of their previous assent in principle to the establishment of such a mint, began to urge on the Indian Government that there was no necessity for the establishment of a mint locally, in view of the fact that experience since the adoption of the Gold Exchange Standard had shown that there was a ready importation of all the sovereigns required from other countries. Had the matter rested here there could have been little to cause surprise, beyond the remarkable illustration afforded by the correspondence of the instability of Indian administration. The most surprising part of the story, however, is still to come. The published papers reveal no further discussion of the matter until it was reopened on May 16 last, nine and a-half years later, when, in a long and somewhat rambling dispatch, which so far as we can see does not break any new ground, the Viceroy and Council urged the opening of the Bombay Mint to the free coinage of sovereigns on the ground that "it will be in time of great assistance in maintaining the stability of the currency system," and that "the proposal has behind it the overwhelming support of Indian public opinion." No objective grounds are adduced in the support of the belief of greater currency stability, and, so far as we can judge from the published correspondence, the sentimental consideration advanced appears to be the only material one. As to the supply of gold, Mr. Seymour's views as to the improbability of attracting imported bullion to the mint are simply brushed aside, though it is admitted that the proposal is in no way calculated to increase importation of gold. The new proposal was, of course, again referred to the Treasury, who replied on August 8 last that they could not accept an scheme involving divided control, and suggesty ing either a branch mint under the supervision of the Master of the Mint and of the Treasury, as in the case of Australia, or else the transference of the whole of the existing mint at Bombay to the British Government, as has been done at Ottawa, under which it would undertake at the expense of the Indian Government the production, not only of British gold coin, but of the subsidiary silver coinage current in India. In forwarding these recommendations to the Viceroy and Council on October 18 last, the Secretary of State for India suggests that both propositions would probably prove unacceptable, and declares that he is prepared to sanction the issue of a separate India gold coin—one of 10 rupees being suggested. When it is remembered that such coins cannot be legal tender; that they do not correspond to any British gold coin in value though the express ground on which the India Office, as stated in their letter of June 27 last year to the Treasury, largely based their proposal was the beneficial effect it would have in popularising the *sovereign;* that no authoritative opinion has been advanced to negative the opinion of the Mint authorities that imported bullion will not flow to the Mint without special consideration, and that the experience of twelve or thirteen years appears to indicate that all necessary gold coin can be readily imported, it will be most interesting to see whether it will be considered well to offer any reasoned explanation for a proposal which, so far as published correspondence goes, seems to indicate that the regulation of Indian currency is at present in the hands of officials who defer neither to technical authority, experience nor common sense. We are loath to believe that if Indian opinion is as wholehearted in support of the issue of a gold R.10 piece as the Indian authorities would have us believe, there are not some good grounds for it, but it only makes the position the more strange that these are not put forward, and the only other alternative would then be that Indian opinion is uninstructed with regard to questions affecting the gold currency. What makes the latest suggestion appear even more inconsequent is the fact that gold coins were minted both at the Calcutta and Bombay Mints representing multiples of the rupee and demonetised as late as 1853. The unexpected announcement by the Premier at the end of last week that a Royal Commission would probably be appointed to study Indian Government finance and the currency question makes it improbable that action will now be taken as suggested by Lord Crewe, and we can only hope that the Commission may be able to suggest reforms which will secure that the control of Indian finance may be in competent and responsible hands.

Widely different as compared with India is the position of China. India has now been in the enjoyment of a currency system bearing a fixed relation to gold for nearly fifteen years, and, as we have seen, not only has it been primarily a great success, but the secondary results hoped from it in the way of changing the financial habits of the people in the direction of European practice are, according to the Indian Government and outside authorities, beginning to show satisfactory growth. In China the whole question has still to be practically attacked, and that without the advantage of a strong central administration and a people already practically familiar with the currency system to which it is desired to conform their own. On the other hand, China undoubtedly has the examples of recent successful conversions to a gold exchange basis in the East which India, Malaya and the Dutch Indies afford. Moreover, recent events have precipitated development in China, so that it is generally recognised that without foreign financing the new State cannot progress, and a return to old conditions is impossible. Equally, the foreign nations who desire to profit by the opening up of China recognise that the field for loans and investment must be greatly affected unless the financial system of the country is placed on a permanent and intelligible basis. Of the various steps taken by the Chinese administration, one of the most important was the appointment of Dr. Vissering, of the Java Bank, as monetary adviser to the administration, and he has prepared a scheme which appears to provide in a comparatively simple manner for the many difficulties which the currency problem is recognised to offer. An abstract of Dr. Vissering's report was lately published in the FAR EASTERN REVIEW. It is well worth attention in that it describes a scheme which seems, in view of experience elsewhere, eminently practicable, and indicates that the conversion of what is now practically copper currency to one based upon gold is not the chimerical scheme that it has been popularly considered. Put in the barest possible outline, he suggests the adoption of a unit approximating to the value of a shilling or half-yen having an equivalent in fine gold of .3644883 grammes. This unit would be introduced first as an abstract denomination into which accounts could be transferred as was desired both by a central national bank and by private institutions. Remittances would be paid in silver or other currencies and paid out again if desired in the same way, the ratio of such payments to the gold unit being calculated at the current price of the day. Such is said to be the practice in China at the present time with regard to taels, which are fictitious units not represented by actual coinage. Once the gold unit was introduced as a unit in book-keeping, the next step would be the issue of bank notes based upon the gold unit created, and as a coincident step the accumulation of gold reserves abroad against these notes. After this it would be possible to declare the bank notes legal tender. Having thus familiarised the large trading public with the idea of a national unit and its value, the important stage would be reached of issuing actual coins for the purposes of the ordinary currency. These coins would, of course, be token coins, and their appearance would require the provision of further gold reserves to secure the stability of their value in terms of gold. This step would present the chief practical difficulties to be anticipated in China, as the intrinsic value of silver coinage must be so low as to secure it against any conceivable rise in the silver market making it a commercial transaction to melt down the coins for the sake of the silver in them. On the other hand, the adoption of a low intrinsic value for silver coins invites smuggling and coining, which, until a reliable customs and preventive force is established and controlled by a strong central administration, it would be almost impossible to prevent in a country like China. With the successful adoption of a silver coinage based on a gold standard we should reach a position corresponding to that of India when the rupee was fixed, and thereafter the question would arise of instituting a gold coinage or the admission of selected foreign gold coins as legal tender. After that would follow naturally the proclamation of the silver token coin and any multiple, as well as of any gold coinage adopted as unlimited legal tender, after which existing coinage, whether silver or copper, could be gradually demonetised and withdrawn from circulation. As will be seen, the proposal is one which would require considerable time for its accomplishment, but assuming it were possible to obtain the co-operation of all the banks, native and foreign, and to secure an efficient administration of laws directed against smuggling and coining, there seems no reason to suppose that the scheme could not be carried out without any disturbance to business or existing interests. The effect on China itself would probably be much greater than we can realise. The Chinese possess intense industry and endurance, as well as a high degree of intelligence, but they are handicapped as compared with European countries by the almost overwhelming impossibility of securing capital. It is no uncommon thing, we are told, for a small business to be run on a capital which would be covered by £5, and despite the greatest exertions little or no progress is possible. Were China able to come freely into the markets of the world for capital requirements, there can be little doubt that the difficulties of finding fresh capital, of which we hear so much to-day, would be considerably intensified, and the demand for further gold supplies proportionately accentuated, while it must not be forgotten that there would be for the purposes of the necessary gold reserves alone a largely increased supply of gold put back into the ground in the form of permanent gold reserves. In the end, of course, it would be easy to pass to an actual gold currency if desired, so that the eventual limitations as to gold requirements of China it would be difficult to indicate.—*The Mining Journal.*

As Mr. Sun To-sun, President of the Bank of China, was appointed Civil Governor of Anhui several names have been mentioned, including Mr. Chen Chin-tao, ex-Minister of Finance, and Mr. King Ting, Commissioner of Finance in Nanking as probable successors at the Bank.

"AMERICAN" HIGH SPEED SENSITIVE RADIALS

The "American" Sensitive Radial Drill is designed and built for the express purpose of providing a machine especially adapted to drilling and tapping small diameter holes at high speeds.



Details of Tapping Arrangement

In the design of this machine is combined the high speed efficiency of the Plain Sensitive Drill with the productive capacity of the Radial, with the result that the drilling and tapping of holes up to and including ¾ in. diameter, in such work as switch boards, automobiles chassis, transmission cases, engine frames and other automobile parts, cash register details, etc., can be accomplished on "American" Sensitive Radial with the greatest possible economy.

Convenience in operating a machine of this type is an essential feature, especially in view of the fact that the time consumed in actually drilling a hole is often very slight "in comparison with the time between holes," or in other words "with the time it takes after drilling one hole to set the machine for the next."

Realizing this fact, we have taken advantage of every opportunity to make this drill easy to operate. All levers and operating members are placed most conveniently for the operator. The feed lever, which is probably used more than any other operating member on the machine is located on the head, directly in front of the operator, on his right hand side, its position making it very convenient to operate, and also obviates any possibility of interference with the work "set up" on the table.

Another advantage of the rachet lever feed used on the "American" Sensitive Radial is found in the fact that when the lever is placed in its vertical position, it is automatically disengaged from the rack pinion shaft and the spindle can then be adjusted quickly up and down by means of a small star knob on the end of the rack pinion shaft. This feature is very quick and handy for bringing the drill to and from the work.

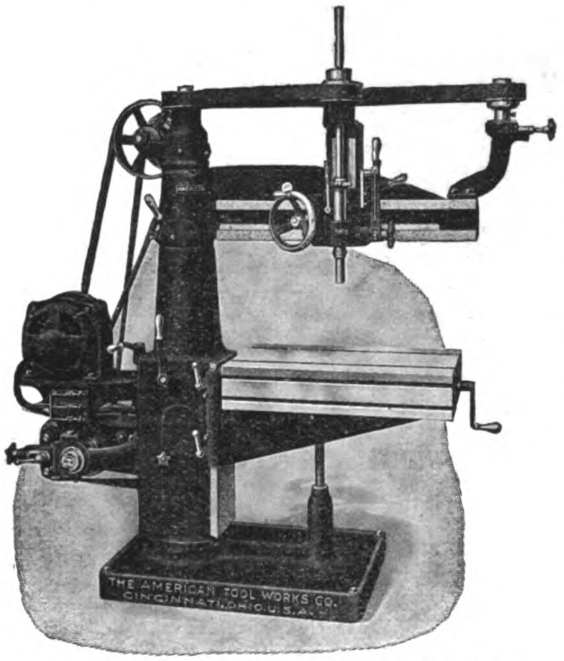
The head, which is nicely balanced, can be removed rapidly along the arm by means of a rack and pinion operated by a hand wheel. This hand wheel is located on the front of the head on the operator's left hand side, its location enabling the operator to swing the arm with his right hand, and at the same time to adjust the head along the arm with his left.

The arm binding lever is located on the column end of the arm where it is always within easy reach of the operator.

The head is of very simple design, consisting of a main saddle, which has a bearing on the arm and carries an auxiliary sliding head upon a vertical dove tail. The sliding head is so arranged that it can be moved to or from the table, thus making possible the accommodation of quite a wide range of work. The auxiliary head can be securely clamped at any point along the dove tail by means of a convenient lever located on the front of the saddle; while the head proper can be firmly bound to the arm by a lever located on the back of the saddle within easy reach of the operator from the front or working side of the drill.

The table is accurately planed and is of full box construction, strongly ribbed and mounted upon substantial legs, forming a most rigid construction. It is of proper height to enable the average operator to conveniently stand up to his work. The top and front sides are fitted with the slots planed from the solid, and the back end is planed so as to be of service in squaring up work, etc.

It is frequently desired to drill larger castings on the Sensitive Radial than can be handled on the stationary table type. In order to accommodate such work, provisions have been made to furnish the "American" Sensitive Radial, at extra charge, with elevating table.



"American" Sensitive Radial with Elevating Table, Tapping Attachment and arranged for Motor Drive.

On this type of machine the distance between spindle and table can be greatly increased over that on the standard table type.

The elevating table is of semi-box construction affording a large area of working service and has an unusually wide bearing on the face of the column, thus insuring, a high degree of rigidity. It has a gib adjustment and is provided with two binders for securely locking it in position. The vertical movement of the table is accomplished from the front by means of a crank which imparts motion to the elevating screw through a pair of mitre gears located under the table.

For the drilling of very large castings, we are prepared to furnish this Sensitive Radial Drill, at extra charge, with Pedestal Base, the table being omitted.

The arm is of our parabolic beam and tube section design, which has afforded such exceptional rigidity on our larger drills, giving the greatest resistance to bending and torsional strains. Its construction is such that the lower line is parallel with the table, thus enabling the full capacity of the drill to be used at any point along the arm. It swings easily on the column and may be securely clamped in any position by means of a convenient binder lever. The arm does not move vertically, therefore provision is made on the head for variable heights of work.

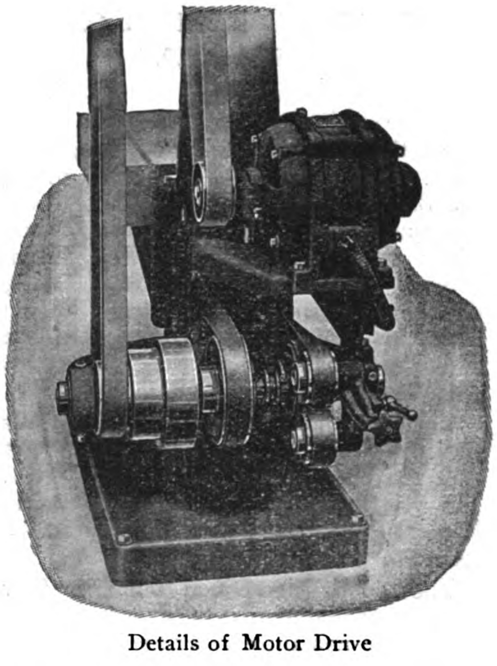
There are no gears in the driving mechanism of this drill from the countershaft through to the main spindle, it being driven by means of a 2-inch double belt running at a high rate of speed, thus transmitting an abundance of power and speed direct to the spindle of the drill. The spindle belt is kept at proper tension by turning the star knob located on arm bracket.

All the driving and idler pulleys are equipped with "American" special ball bearings, which consist of a double set of hardened and ground ball races and cones, one set being located at each end of the pulley journals. They are so constructed as to be dust proof and form a retainer for the lubricant (preferably vaseline and graphite), which needs to be renewed only at long intervals.

Spindle is of high carbon crucible steel, accurately ground and provided with a dust-proof self-lubricating ball thrust bearing. Has six changes of speed ranging from 300 to 900 r.p.m. in geometrical progression, and is provided at the top with an adjustable stop collar, which may be used as a depth guage.

Column is of tubular section, well ribbed internally and of sufficient stiffness to withstand the strains to which it is subjected. It extends through the arm into the cap at top of drill and is firmly bolted to the top of table.

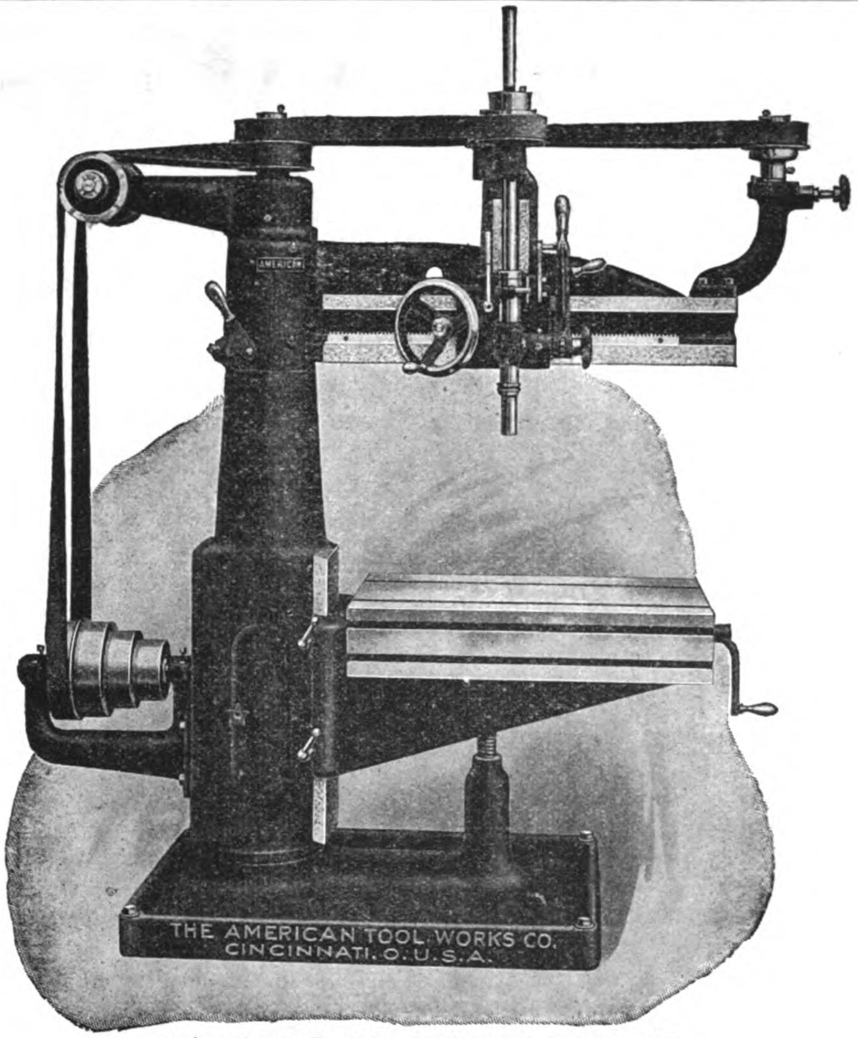
Countershaft is of special design for high speed work, providing two speeds. The boxes in hangers are of our new improved gravity and wick oiling type, taking their supply from large oil reservoirs, needing attention only at long intervals. Countershaft carries a 3-step cone pulley, with a pair of friction pulleys 10 in. dia. by 3 in. face, and should run 310 and 387 r.p.m. With belt driven machines having tapping attachment a single speed countershaft is furnished, the six spindle speeds being obtained through the 3-step cone pulley and a pair of friction pulleys of different diameters located on the rear of the machine.



Details of Motor Drive

Regular equipment, upon which base is determined, includes countershaft and belts. Wrenches are not required. All motor driven machines are regularly provided with tapping attachment and cannot be furnished otherwise.

At extra charge we can furnish this machine with elevating table, tapping attachment, motor drive, Pedestal Base, and additional pulleys for producing greater number of speeds.



"American" Sensitive Radial with elevating table

THE TRIBAL AND ADMINISTRATIVE SYSTEM OF MONGOLIA

(*Continued from page 48*)

form the Unen Sutzuktu League. (2) three hoshuns of Hoshuts forming the Batu Setkhiltu League. The whole are under the charge of the Ili Chiang Chün who lives at Suiting or Suidun, a post founded in 1764. The Chiang Chün has two military assistants, Fu Tu T'ung, who live respectively in Kuldja and Chuguchak, and two civil assistants who also live in Kuldja and Chuguchak.

The ten hoshuns of Old Torguts returned from Russian territory in 1771 (see above under Etsingol Old Torguts). The league is divided into Southern, Eastern and Western and northern sections.

The southern section contains four hoshuns, including that of Tzoriktu Khan. The above nomadize along the R. Yuldus (south of the T'ien Shan, north of Harashar).

The northern section contains three hoshuns which live on the R. Kobuk to the east of Chuguchak and are under the Chuguchak Fu Tu T'ung. They also are known as the Kobuksari aimak.

The Eastern section consists of two hoshuns. These nomadize along the R. Jirgalan near Kur Kara Usu and are consequently known as the Kur Kara Usu aimak.

The Western section forming the Tzinho aimak consists of one hoshun, that of Jirgalan Pei-le. Their lands are on the Tzin-ho to the east of the town of Kuldja. (The Tzin Ho is the same as the Kash and Kunguz Rivers in the Ili basin).

The three hoshuns of Hoshuts forming the Batu Setkhiltu League nomadize in the western part of the valley of the Yuldus.

Besides the above Eleuth tribes, there are in the Borotola valley, to the west of Ebi Nor, a section of the Ch'ahars, who were transported hither after the subjugation of the Ch'ahars by the Manchus. Mr. Douglas Carruthers describes the Borotala as the richest part of Jungaria and the Ch'ahars as far superior and more well-to-do than their neighbours, the Torguts.

Such is the tribal and administrative system of the various sections of the Mongols. That the administrative system is in a process of change is obvious, but the fundamental tribal differences will of course remain. In the meantime it is impossible to foresee exactly what form the changes will take as the result of the interaction of the three interested parties, the Russians, the Mongols and the Chinese. At present chaos still reigns, but the body which seems to have the greater power of attraction for the loose particles would seem to be Urga and not Peking. Behind Urga is the restraining, moderating influence of Russia.

May 3rd, 1913.

Appendix

The following is a table showing the various divisions and subdivisions of the Eleuths.
(N.B.—H. means "Hoshun"

ELEUTHS

- Choros
  - Choros or Jungars
    - 1 H. of Jahachins in Kobdo Distr.
    - 2 H. in Kuku-Nor
    - 2 H. in Sain Noin
  - Durbets
    - Part of the Volga Kalmuks
    - 14 H. in Sain Tzayagatu League of Kobdo Distr.
    - Durbet H. of Cherim League
- Hoshuts
  - Alashan Hoshuts 1 H.
  - 21 H. of Kukunor Hoshuts
  - 3 H. of Hoshuts in Ili forming Batu Setkhiltu League
  - 1 H. of New Hoshuts in Altai
- Hoits
  - 1 H. of Kukunor Hoits
  - 2 H. of Hoits in Sain Tzayagatu League of Kobdo District
  - Hoshun Mannai of Hoits near Tsitsikar
  - 1 Hoit Hoshun in Jasaktu Khan Aimak
- (unnamed branch)
  - Eleuth H. of Barga
  - 40 families of Old Eleuths near Tsitsikar
- Torguts
  - 4 H. of Kukunor Torguts
  - 10 H. of Old Torguts of Unen Sutzuktu League in Ili
  - 1 H. of Etsingol Old Torguts
  - 2 H. of New Torguts in Altai (R. Bulgun) Ch'in Setkhiltu League
  - Part of the Volga Kalmuks.

FAR EASTERN RAILWAYS

CHINA

Chekiang-Kiangsi Railway.—A Hangchow telegram to the *Minlipao*, dated the 26th June, reports: Tang Shou-shen, the President of the Chekiang Railway Administration, has returned to Hangchow after inspecting the proposed line between Chanchan of Chekiang and Yuehshan of Kiangsi in view of connecting the line in Chekiang with that of Kiangsi.

The Kiangsu Railway.—The Ministry of Communications has deputed Chung Wen-yao and Chang Shu-jung to proceed to Kiangsu to take over the charge of the Shanghai-Kashing Railway, the ownership of which has been transferred to the Government, and Mr. Mai Yu-sheng will be the provisional representative to manage for the present all the accounts in connection with the Company.

The Engineering Office of the east end of the Lung-Tsing-U-Hai Railway is established at Tungshan-hsien, Hsuchow, and the Director Shih has appointed Mr. Chen Chung-yun, Secretary of the Ministry of Navy, to be the Chief of the office Mr. Chen has taken over charge of this office and it is expected that the work of construction will soon commence.

Canton-Hankow Railway.—A correspondent wrote from Hengchow, Hunan, on June 21, as follows:—Mr. Wilson, the chief engineer of the Canton-Hankow Railway for this vicinity, arrived in Hengchow over a month ago, together with his assistant, Mr. Chifford, and a host of Chinese assistants. They are to determine the course of the railroad from Hengshan (at the foot of the sacred mountain, Nanyoh), some fifty miles north of here, to Leiyang, some fifty miles south of us. They have already commenced the work of surveying and planting strong permanent stakes which will mark the final decision in regard to the course of the railroad. The engineers are taking no summer vacation and hope to have this division of the road staked out by next Christmas. They give us the hope that in three or four years we will actually see trains running between Hankow and Canton.

There will probably be no violent opposition to the building of the railroad in Hengchow fu. In regard to the feelings of the gentry, I am not informed, but so far it is evident that the common people hail the coming of the "iron road" gladly.

Machine Shops for Hankow.—the *Cologne Gazette* reports that some French and Belgian capitalists are making arrangements for purchasing the necessary ground at Hankow for the purpose of erecting machine shops for the construction of Railway Locomotives, carriages, &c.

Hankow-Ichang Railway.—A correspondent wrote to the *Central China Post* on June 17 from Anlu, Hupeh, as follows:—During the last few days a surveying party for the Hankow-Ichang railway has arrived at Anlu. At their head is a German. A proclamation issued locally states that, after consulting with an eminent German firm of engineers, it had been decided at headquarters to try a more southerly route than the one previously surveyed, which went through Kwanghsui, Hsiangyang, Kingmen and on to Ichang. The route at present being surveyed is stated to be from Siaokan, where it joins the Peking line, through Yincheng, Teian (probably not the town itself), Kingshan, Anlu, then on to Kingmen and Ichang. In this case on the west of the Han the direction will differ little from that of the northerly route, but the distance from Hankow to Ichang will be considerable shortened. Naturally the local population is considerably excited over the prospect of a railway coming right into its midst, but so far there seems to have been no unfavourable comment or suggested opposition.

SHANGHAI-NANKING RAILWAY

The following figures of traffic returns (approximately) for the week ended June 14 are issued by the Shanghai-Nanking Railway:—

Year.	Passengers.	Goods and Sundries.	Total for the week.
	$	$	$
1913....	48,067	17,001	65,068
1912....	41,715	11,862	53,577
Increase.	6,352	5,139	11,491
Decrease	—	—	—

For twenty-three weeks.

Year.	Passengers.	Goods and Sundries	Total
	$	$	$
1913....	1,147,636	238,579	1,386,215
1912....	1,133,803	153,145	1,286,948
Increase.	14,833	85,434	99,267
Decrease	—	—	—

Week ended June 21

Year.	Passengers.	Goods and Sundries	Total for the week.
	$	$	$
1913....	42,854	19,209	62,063
1912....	40,490	9,452	49,942
Increase.	2,364	9,757	12,121
Decrease	—	—	—

For twenty-four weeks.

Year.	Passengers.	Goods and Sundries	Total
	$	$	$
1913....	1,190,490	257,788	1,448,278
1912....	1,174,293	162,597	1,336,890
Increase	16,197	95,191	111,388
Decrease	—	—	—

Week ended June 28:—

Year.	Passengers.	Goods and Sundries.	Total for the week.
	$	$	$
1913....	42,411	13,677	56,088
1912....	36,703	8,542	45,245
Increase.	5,708	5,135	10,843
Decrease	—	—	—

For twenty-five weeks.

Year.	Passengers.	Goods and Sundries.	Total.
	$	$	$
1913....	1,232,901	271,465	1,504,366
1912....	1,210,996	171,139	1,382,135
Increase.	21,905	100,326	122,231
Decrease	—	—	—

Week ended July 5

Year.	Passengers.	Goods and Sundries	Total for the week.
	$	$	$
1913....	43,766	12,319	56,085
1912....	37,441	7,266	44,667
Increase.	6,325	5,093	11,418
Decrease	—	—	—

For twenty-six weeks.

Year.	Passengers.	Goods and Sundries.	Total.
	$	$	$
1913....	1,276,667	283,784	1,560,451
1912....	1,284,437	178,365	1,426,802
Increase.	28,230	105,419	133,649
Decrease	—	—	—

Week ended July 12

Year.	Passengers.	Goods and Sundries.	Total for the week.
	$	$	$
1913....	41,753	11,024	52,777
1912....	37,702	9,317	47,019
Increase.	4,051	1,707	5,758
Decrease	—	—	—

For twenty-seven weeks.

Year.	Passengers.	Goods and Sundries.	Total.
	$	$	$
1913....	1,318,420	294,808	1,613,228
1912....	1,286,139	187,682	1,473,821
Increase.	32,281	107,126	139,407
Decrease	—	—	—

Tsingkiangpu-Tungchow Line.—A Chinese report is as follows:—Some time ago a loan was negotiated between Messrs. Chang Chien and Li Sheng-tsai on the one hand and a certain Belgian on the other for the construction of a railway between Tsingkiangpu and Tungchow. The negotiations resulted in the signing of a preliminary agreement which was to come into effect on the condition that the transaction should receive the sanction of the Ministry of Communications. The said Ministry, however, refused to sanction the project on the ground that the proposed line conflicted with a section of the Haichow-Laichow-Railway. The disapproval of the Ministry made the signed agreement null and void; and the project was consequently abandoned altogether by the parties concerned.

Likin on Railways.—With a view to encouraging trade a Presidential Mandate was issued ordering the abolition of the Hatamen likin branch office in Peking as well as the offices in Fengtai, Machang, Nankou, Kalgan, Kangchuang, Hsuanhuafu and other places situated on the Tientsin-Kalgan Railway. The likin offices was to be closed from July 1. The Ministry of Finance has to pay $100,000 to meet the falling off in the provincial budget of Chihli. The Mandate leaves it to the discretion of the other provinces to introduce the same reform or not.

Cheng Tai Railway.—A Peking telegram reports that on 4th July the Russian Minister sent a despatch saying that the time of repayment of the loan of £400,000 for the Chengtingfu-Taiyuanfu Railway have passed and if the sum cannot be paid a portion of that railway must be placed under the Russian control.

Nationalizing the Railways.—A Peking telegram said that the railway between Shanghai and Kashing and the Hunan Railway would be state owned from 1st August, when all the accounts would be cleared.

The Pu-Hsin Railway.—With regard to the 5% Pu-hsin Railway Loan it is only through successive negotiations between the Ministry of Communications and the British Minister that the present result has been arrived at. The Ministry sometime ago sent the original contract to the Cabinet with a despatch requesting its approval and transmission, after approved, to the House of Representatives. The Cabinet, it is reported, submitted this bill to the House. The despatch of the Ministry reads as under:—

On January last the recommendation of this Ministry that Sheng Yun-pei be appointed to render preparations on the Pu-hsin Railway Affairs was duly approved by the President. To trace the beginning of this railway we must go back to the 24th year of the reign of Kuangsu of the Manchu regime when the British merchants demanded that they be

allowed to contract for the construction of one of the 5 lines. By the order of the Tsung-li Yamen the Chief Railway Company was authorized to propose and sign a preliminary agreement consisting of five articles which provided that the line shall commence from Pukow, Anhui to Hsinyang, Honan and that all details regarding the loan shall be dealt with in accordance with the Shanghai-Nanking Railway. Since then the British Minister has repeatedly requested that a formal Contract be signed; during the reign of Hsuan-tung he requested more urgently and after the inauguration of the Republic the representative of the British Syndicate Mayers (?) again brought up the matter.

As a preliminary agreement has been signed in the Manchu regime the matter cannot be disregarded nor be longer deferred. Moreover, the proposed line connects the two main lines, Tsin-pu and Kin-han and runs through the fertile plains of Anhui and Honan; the traffic of the former as well as industries of the latter will be greatly facilitated by its construction. If men proficient in the Railway management and well acquainted with the geological features and products of these two provinces should be deputed to handle this matter, one of the diplomatic questions is finished and the plan of communication will be facilitated. Hence it has been decided to proceed with the matter.

Since the appointment of Sheng Yun-pei the representative of the British Syndicate has been approached with a view to draw up a contract for a loan. At first the representative persisted that the matter be carried out according to the precedent of the Shanghai-Nanking Railway as stated in the preliminary agreement. But Sheng proposed (1) that although the funds required for the construction will be raised from British sources according to the original agreement, the contract should be further considered, and (2) that as the Tsin-pu Railway has been completed, Pukow should not have two large stations and the line should be altered. Owing to these two proposals considerable difficulty has been experienced during the negotiations and after the return of the said representative to London for instructions a contract consisting of 25 articles has been drafted and is termed as "5% Pu-hsin Railway Loan." It has been carefully examined by Sheng together with the Ministries of Finance and Communications and amended by the said representative. The loan amounts to a sum of 3 million pounds with interest of 5%, a commission of 5% and a term of redemption of 40 years. The details governing the materials for construction and the administration have also been provided. In comparison with that of the Shanghai-Nanking Railway this contract affords many more advantages to the Chinese. Besides this the syndicate agrees to make advances, the Director-General has the liberty of locating the line, the amount of commission is reduced and the bonus is dispensed with. In general we have obtained all we can expect and the right mean is attained; but in consequence of the provisions of the preliminary agreement, the terms of the contract are not so satisfactorily perfect as they should be. However, in a time when the large loan was just concluded, the recognition of different Powers has not yet been accorded, and all financial questions bear an intimate relation with politics, many difficulties have been encountered and greatest pains have been taken to arrive at even the present result, and solve an Anglo-Chinese question pending for 15 years. The British Minister Sir John Jordan is also desirous to see this matter speedily carried out.

As this matter facilitates diplomatic relations, it should be quickly approved by the administrative and legislative organs so as to conclude it and maintain our credit. The proposed contract consisting of 25 articles is hereby submitted both in English and Chinese for approval.

Railways in Yunnan.—The British Consular report on the trade of Mengtsz for 1912 says that the problem of the construction of the Yunnan-Kwangsi railway occupied public attention in 1912, and the new Government has evinced a keen desire to put the work in hand as soon as the necessary funds can be obtained. At the present moment the trade of Yunnan passes to and from the coast by the French railway which, owing to the great cost of upkeep, is obliged to charge exorbitant, and in some cases, almost prohibitive, freight rates. The construction of a line connecting the province of Yunnan with the West River will of necessity force the French to lower their tariff, thereby introducing a healthy competition which is at present lacking. Indeed, as in 1912 Hongkong took 86 per cent. of the trade of Mengtsz, which is the market for Eastern Yunnan, there is every likelihood of a large part of the trade being diverted to the new route. The line was surveyed from Poseh in Kwangsi at the head of navigation on the West River as far as Kutsingfu in Yunnan by Taotai Lo in 1911, and at the time of writing (9th March, 1913), the survey of the portion between Kutsingfu and Yunnanfu is being completed by Mr. Dawley, the American engineer in the employ of the Yunnan Government, who has found a practicable, though difficult, route into Kweichow. The line will strike northwards from Poseh into Kweichow passing through Singyifu, then westwards to Loping in Yunnan, northwards to Kutsingfu, and finally westward to Yunnanfu *via* Malungchow and Yanglin.

The much discussed branch line from the French railway at Pishihchai (Mengtsz) to the tin mines at Kochin has not yet materialised. The line, which would be some 35 miles long, was carefully surveyed in 1912 by the American engineers, Messrs. Dawley and Hawks, but the Yunnan Government has been unable to decide whether it shall be built by the mine-owners at their own expense, by the Government as part of a branch line to connect Linanfu with the French railway, or by the French Railway Company. Of the three alternatives, perhaps the last offers the best solution of the difficulty, as the cost would be less and the workmanship better—the line being built by French engineers who have had experience of local conditions when constructing the main line from Tongking to Yunnanfu.

Mr. Dawley has gone to America on leave, but he expresses the greatest confidence in the ultimate future of Yunnan.

The Kiangsu Railway.—Agreement made between the Kiangsu Railway Company (hereinafter called the Company) represented by Yang Ting-tung (hereinafter called the Representative) of the one part, and the Ministry of Communications (hereinafter called the Ministry) of the other part, for the nationalization of a Railway line belonging to the Company, under the following terms and conditions:—

Article 1.—The Company hereby agrees to surrender completely to the Government, according to the resolution of the Shareholders' Meeting of the Company, all the properties and privileges of the Shanghai-Kashing Line, *i.e.* the Railway Line from Shanghai to Fengching, which shall be controlled and managed direct by the Ministry; and to cancel the concession of all privileges previously granted to the Company by the Government.

Article 2.—The Ministry hereby agrees to refund to the Company all the Capital of the line, namely:—Proper Shares $3,476,523 and Interest Shares $1,073,895 (the latter amount is not yet considered settled until proper calculation is made), by issuing to the Company a number of Bonds of fixed dates. This Capital shall be repaid in five years from the date of the taking over of the line, and the repayment shall be made in three instalments in each year, in accordance with the separate schedule. It is, however, understood that any of the instalments of each year may be made before the stipulated time, provided two months' previous notice shall be given by the Ministry to the Company to this effect.

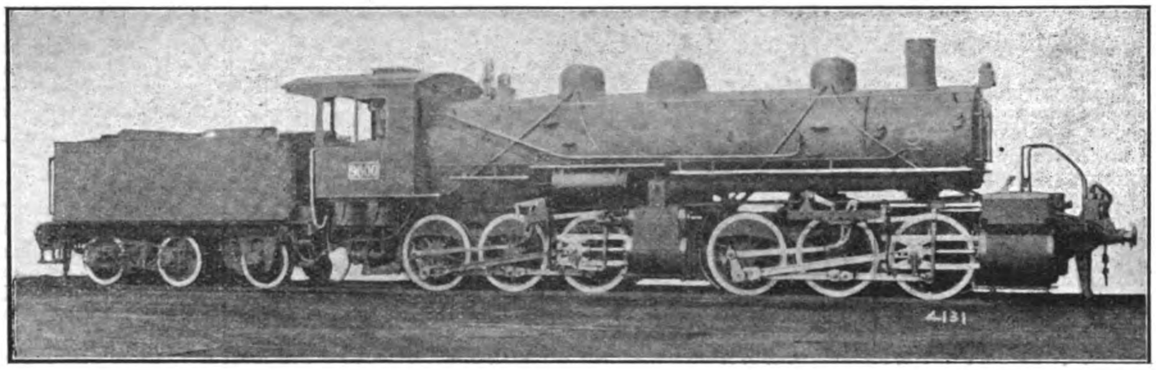
Article 3.—From the date of the taking over of the line, the Capital which has not yet been repaid by the Ministry shall also bear yearly interest at the usual rate originally decided upon by the Company, and this interest shall be paid by the Ministry at the same time together with the repayments of the Capital, when the instalments become due.

Article 4.—All Bonus or Founder's Shares which formerly existed shall be null and void. They shall not be considered as Capital nor shall they be entitled to the repayment of principal or the payment of interest.

Article 5.—Of the 14 Regulations regarding Deposits of the Kiangsu and Chekiang Railways, drawn up by the former Board of Posts and Communications on the 15th day, 3rd month, of the 34th year of Kuang Hsu in the late Ching Dynasty, all those which refer to the Kiangsu Railway shall be annulled from the date of the taking over of the line.

Article 6.—After the closing of the Company, an organ of account-calculation shall be established. How this organ is to be established shall be decided separately.

Article 7.—All the liabilities and assets which really belong to the Company shall be transferred to the Ministry, but the amounts of



Baldwin Mallets for Japanese State Lines

them shall be determined by those contained in the 6th Report of the Company.

Article 8.—After the signing of this Agreement and before the taking over of the line, the Company shall be fully responsible for all the properties, incomes and expenses of the Company itself.

Article 9.—With the exception of cases having special reasons, all the terminable agreements and contracts of employment, transportation, lease, etc., entered into between the Company and other parties, shall continue to be in force until the expiration of their respective terms.

Article 10.—On the signing of this agreement, the Ministry shall depute officials to the Company to calculate carefully the accounts, and the Company shall instruct its responsible officers to prepare detailed lists of properties together with all the books, documents and vouchers, and to submit them to the Ministerial Officials for comparison and signature.

Article 11.—It is mutually agreed that the taking over of the line shall be effected on the 1st day of the 7th month, of the 2nd year of the Republic.

Article 12.—The Ministry shall not be responsible for the repayment of any money that has not been stipulated in this agreement.

Article 13.—Should any detailed procedure be required for carrying out the terms and conditions of this agreement, it shall be decided by the Representative and the Ministry after mutual agreement.

JAPAN

Japanese State Railways.—The rough draft of the accounts of the Imperial Railways for the first fiscal year of Taisho (April, 1912, to March, 1913) is nearly ready The result of the year's working was unexpectedly good compared with the returns for several years previously. The gross receipts are returned as Yen 111,020,000 and the expenditure as Yen 92,100,000, including Yen 500,000 added to the reserve fund, showing a net profit of Yen 19,600,000 and an increase in the latter of Yen 9,500,000 compared with the estimate. On the Kyushu Railway, the returns for which are included in the above totals the gross receipts were Yen 15,966,276 and the expenditure Yen 6,002,459, showing a net profit of Yen 9,963,810 —an increase on the estimate of Yen 528,554.

Baldwins for Japanese State Lines.—Eighteen locomotives were ordered in July, 1912, by the Imperial Government Railways of Japan from the Baldwin Locomotive Works of Philadelphia for heavy freight service between Tokyo and Kobe and have recently been placed in actual service. The size of the engines was limited by the narrow gauge (3'-6") and the weight was limited by the existing bridges, but maximum dimensions and capacity were desired under these limitations, in order to haul the heaviest possible trains. To meet these requirements the Imperial Government Railways selected the Mallet Articulated Compound type, equipped with a high degree superheater. The Baldwin Locomotive Works designed the locomotives throughout for lightness consistent with strength. For this purpose parts made of cast steel are liberally employed; the driving and tender axles are made of acid open hearth steel, bored hollow for lightness and heat treated, the driving and tender tires are also heat treated, thus securing the highest elastic limit and greater uniformity in the structure of the metal.

The locomotives in general design as well as in detail are thoroughly modern and represent the best practice in the United States; they are among the heaviest locomotives ever built for a narrow gauge Railway.

The principal dimensions and weight are as follows:

Gauge of track	3'-6"
Cylinders, high pressure.	16" diameter
„ „ „	24" stroke
„ low pressure,	25" diameter
„ „ „	24" stroke
Boiler pressure	220 lbs per sq"
Boiler diameter	58 inches
No. of tubes	2¼ diam. 101
„	5½ „ 16
Length of tubes	16'-4"
Heating Surface of Firebox	122 sq. ft.
„ „ Tubes	1,341 sq. ft.
Total	1,463 sq. ft.
Superheating Surface	323 sq. ft.
Grate Area	21.2 sq. ft.
Diameter of driving wheels	49 inches
Rigid wheel base	9'-0"
Total Wheel base of Engine	26'-2"
Total, Engine and Tender	48'-0"
Weight of Engine in Working Order	142,650 lbs.
Weight of Engine and Tender Working Order	205,000 lbs.
Capacity of Tender	3,240 U. S. Galls.
Coal Capacity	3 gross tons.

New Light Railways.—The Railway Board has granted a charter to the Onsen Electric Railway Company, promoted by Mr. Yokoyama and 62 others, for the construction of a light railway to connect Kanan village, Enuma district, with Komatsu, Nobi district in Ishikawa prefecture, and also to connect Naya village, Enuma district, with Dohashi of the same district in Ishikawa prefecture. The length of the light railway is 14 miles with a gauge of 3 feet and 6 inches. The capital of the company is 600,000 yen.

A charter was also granted to the Onoda Light Railway Company, promoted by Mr. Kasai and nine others, for the construction of a light steam railway connecting Suye village, Atsusa district, with Takachiho village of the same district in Yamaguchi prefecture. The length of the railway is 3 miles with a gauge of 3 feet and 6 inches. The capital of the railway company is 150,000 yen.

The Railway Board has granted a charter to the Shiratana Light Railway Company for the construction of a light railway, 14 miles in length, connecting Shirakawa, Nishi Shirakawa district, with Tanakura, Higashi Shirakawa district in Fukushima prefecture.

A charter was also granted to the Nagao Railway Company for the construction of a light railway to connect Fusokame village, Koshi district, with Tochio town of the same district in Niigata prefecture. The length of the light railway is 11 miles and 20 chains.

MANCHURIA

South Manchuria Railway.—The S. M. R. Traffic Returns for the month of June were as follow:—

	Yen.
Aggregate..	1,430,798
Daily Average..	47,693
Increase on corresponding month of last year	11,004

At the last general meeting of shareholders the South Manchuria Railway Company proposed the issue of the second shares, this proposition being approved by the meeting. The first call on the new shares to the amount of 4,000,000 yen will be paid in by September 1st. This amount will be applied to new works to be undertaken during the current fiscal year. This sum alone, however, being insufficient for these new undertakings, the company is expected to make calls for the last instalment on the first shares (40 yen per share) probably towards the middle of December, according to the state of the money market. It is not expected that the second instalment on the new shares will be called before June next.

Kirin-Changchun Railway.—Mr. Wu-wu, Director of the Kirin-Changchun Railway, has given the following information in regard to the line:—The Kirin-Changchun Railway now earns about Y50,000 a month. The winter traffic being much heavier, the total annual receipts may be safely put at Y800,000, which, we hope will be easily raised to Y1,000,000 when the tunnel through Tumenling Pass is completed and the Line is put in full working order. At present the management is receiving a government supply of S. Y60,000 per month. We make shift to keep things going on this government supply and the net profit of the Line. The tunnelling work through Tumenling will be started next September. The work will be prosecuted through the winter as far as possible on the plan of finishing the work by June, 1914. The road-bed is now being ballasted to make it firmer.

THE PHILIPPINES

Manila Railroad Co.—This company has awarded a contract for a station at Paco to cost P 120,000. The building will be about 170 feet long and 60 feet deep. The building will be constructed entirely of reinforced concrete, and when finished will be one of the most beautiful structures in the city. The Manila Railroad Company expects the traffic through the Paco station to increase rapidly during the next few years. The lines serving there are the main northern line, the southern line which, when extended, will extend to Albay, the Antipolo line, and the Cavite line.

MALAYA

Malayan and Siamese Systems.—The *Straits Echo* in a recent issue recapitulates the arguments advanced by it in favour of the linking up of the Malayan and Siamese railway systems via Kedah, and does so because of "various important changes in the situation—notably the formation of a Bangkok Chamber of Commerce which will be able to voice with authority the views of the commercial community in the Siamese capital and the disappearance of some of the strong vested interests deeply concerned in the development of Trang."

The conclusion of the article runs:—

"This question, while of great interest to Penang and Kedah, is of vital and paramount importance to Siam. Rapid communication with Europe is the avowed desire of the mercantile community of Bangkok, which has long complained of its isolated position and the inconveniences, delays, and losses which result from the fact that at present the mails from Siam have to be carried round the Peninsula by steamer. These drawbacks would be altogether removed if the mails were merely transhipped at Penang and placed in a train which would land them in Bangkok without any further handling or transhipment. They will only be partially alleviated if the Kedah line is allowed to stop short a few miles from the Siamese boundary and the scheme, outlined above, of shipping the mails from Penang to Trang, and transferring them there to a railway for transit to Bangkok, is adhered to. We can hardly imagine that the merchants and people of Bangkok are so blind to their own interests as to allow the matter to be finally settled in that sense and the East coast route adopted, without making energetic representations in the quarters to which the question will be referred for a definite decision."

PUBLIC WORKS

Bridge at Kyoto.—The reconstruction of the Shijo bridge, Kyoto, Japan, which has been going on for nearly a year and a half, has at length been completed, with the result that the natural beauty of Kyoto has acquired a considerable addition by the creation of a triumph of modern engineering skill. The cost of the work is said to have been something over Y 200,000. The foundations of the bridge are of iron, cased with concrete, while the bridge itself is of granite, measuring 300 feet in length and 72 feet in width. Elaborate arrangements for illumination have also been set up.

THE CANTON-CHUNGKING RAILWAY

The outbreak of the rebellion has, at all events temporarily, prevented the conclusion of an agreement for the financing and construction of the railway from Canton to Chungking, with an extension to Lanchow. The preliminary agreement, which was signed on July 4, was between the Chinese National Railway Corporation and Messrs. Pauling and Co., Ltd., who were to build the line by contract. In many respects the preliminary agreement was the most favourable for China yet concluded, and it is hoped that the political disturbances will not prevent its ultimate adoption.

GENERAL

Intercontinental Through Passenger Traffic.—The Intercontinental Through Passenger Traffic arrangements between Japan and Berlin, Paris and London were to come into effect on 10th August.

The through traffic stations in Japan are as follows:—

Shimbashi (Tokyo), Hiranuma (Yokohama), Kyoto, Osaka, Kobe, Shimonoseki, Moji, and Nagasaki.

The through fares from Shimbashi are as follows:—

To	1st Cl.	2nd Cl.
Berlin	Yen 369.58	Yen 258.94
Paris	417.25	291.55
London	436.78	309.83

Through tickets are issued only for 1st and 2nd class express passengers, and are available for three months. A through passenger is offered the option between the two routes via Vladivostok and Dairen, also between the undermentioned routes:—

For Berlin:—

1) via Moscow, St. Petersburg, and Wierzbolowo.
2) via Biatka and Alexandrowo
3) via Moscow, Warsaw, and Skalmierzyce.

For Paris: Berlin, Achen, Verviers, Liege and Jeumont.

For London:

1) via Berlin, Achen, Liege, Ostend, and Dover.
2) via Berlin, Hanover, Hook van Holland, and Harwich.

The arrangements were agreed upon at the International Railway Conference at Brussels in the summer of 1911.

TRAMWAYS

Shanghai Tramways

The following is the traffic return of the Shanghai Tramways (Foreign Settlement) for the month of June, 1913, and for six months ended June 30, 1913, with figures for corresponding periods last year.

	June, 1913.	6 months ended June 30, 1913.
Effective Receipts . . .	$77,138.87	$423,414.96
Passengers carried. . .	4,074,306	21,344,666
Car Miles run	256,692	1,356,311
Loss by depreciation of subsidiary coinage . .	21,919.67	116,382.65
Percentage of loss by depreciation of subsidiary coinage . .	23.35	22.87

	June, 1912.	6 months ended June 30, 1912.
Effective Receipts. . .	$67,378.70	$380,680.55
Passengers carried . .	3,477,937	19,188,576
Car miles run	228,892	1,352,622
Loss by depreciation of subsidiary coinage . .	21,184.91	117,706.89
Percentage of loss by depreciation of subsidiary coinage	25.44	25.18

Week ended June 18, 1913:—

	1913.	1912.
	$	$
Effective receipts (after deducting loss on subsidiary coinage). . . .	19,064.99	16,097.92
Passengers carried . . .	1,018,885	832,312
Car miles run	64,423	53,194

The loss by depreciation of subsidiary coinage for the week was equal to 23.28 per cent. of the gross cash collected on the cars as compared with 25.41 per cent. for the corresponding week last year.

Week ended June 25, 1913:—

	1913.	1912.
	1912.	1912
	$	$
Effective receipts (after deducting loss on subsidiary coinage). . . .	17,412.67	15,235.44
Passengers carried . . .	924,051	794,204
Car miles run	60,995	52,885

The loss by depreciation of subsidiary coinage for the week was equal to 23.28 per cent. of the gross cash collected on the cars as compared with 25.60 per cent. for the corresponding week last year.

Week ended July 2, 1913:—

	1913.	1912.
	$	$
Effective receipts (after deducting loss on subsidiary coinage). . . .	17,743.43	15,783.93
Passengers carried . . .	939,460	828,035
Car miles run	60,826	53,799

The loss by depreciation of subsidiary coinage for the week was equal to 23.28 per cent. of the gross cash collected on the cars as compared with 25.76 per cent. for the corresponding week last year.

Week ended July 9, 1913:—

	1913	1912
	$	$
Effective receipts (after deducting loss on subsidiary coinage). . . .	18,057.72	15,566.14
Passengers carried . . .	958,999	809,754
Car miles run	57,653	53,627

The loss by depreciation of subsidiary coinage for the week was equal to 23.23 per cent. of the gross cash collected on the cars as compared with 25.77 per cent. for the corresponding week last year.

Week ended July 16, 1913:—

	1913.	1912.
	$	$
Effective receipts (after deducting loss on subsidiary coinage)	18,147.10	15,678.93
Passengers carried . . .	949,828	824,514
Car miles run.	59,357	55,415

The loss by depreciation of subsidiary coinage for the week was equal to 22.80 per cent. of the gross cash collected on the cars as compared with 25.71 per cent. for the corresponding week last year.

MINING

Colorado (P. I.) Mines.—The Colorado mines have been turning out from P.30,000 to P.40,000 each half month and work is reported to be progressing rapidly in developing the ore. The Colorado mines have long since passed the experimental stage and are turning out dividends to the stockholders regularly. The mines, located in Masbate, are considered the best that the Philippine Islands have as yet developed.—A new filter installed at the Colorado Mining Company's mill is expected to increase the output of gold materially. The capacity of the mill is enlarged by from 800 to 1,200 tons and a greater percentage from the dissolving values is saved.

Mining Enterprises in South China.—The United States Consul-General, George E. Anderson, of Hongkong, reports that a considerable revival of mining enterprises in South China districts near Hongkong seems to be going on mostly in the southern portion of Kwangtung and in Kwangsi Provinces. These provinces are known to contain gold and silver, as well as antimony, which is already mined; tin, which is mined in a crude way to a small extent, and other and less valuable metals. The prospects of mining and the activity of prospecting has led to the establishment of an assay office in Hongkong by an American trained Chinese mining engineer. The office is equipped for all ordinary assay work. Several mining undertakings of some note are now in hand by various native concerns. One, operating for gold and other metals in Kwangsi Province, recently put in considerable pumping and other machinery, mostly of American make. Another Canton concern, with an American-trained mining engineer for manager, is operating for gold, and has recently put in a stamp mill and considerable modern American machinery. A Hongkong company is planning operations in the southeastern portion of Kwangsi. There is considerable prospect of active mining work being undertaken this summer in Hunan Province. A large company has been formed, and proposes to open a coal mine and also to undertake mining for tin, lead, gold, silver, and other metals.

Mining in the Philippines.—The following statistics of mineral production in the Philippine Islands for the year 1912 have been compiled by the division of mines, Bureau of Science:

	1911.		1912.		Increase (÷) or Decrease (−).	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
		a. *Pesos.*		a. *Pesos.*		a. *Pesos.*
Metallic:						
Iron—metric tons . .	73	29,159	141	49,272	÷ 68	÷ 20,113
Silver—fine ounces. .	3,383	3,606	7,121	8,664	÷ 3,738	÷ 5,058
Gold —fine ounces. .	9,190	379,906	27,582	1,140,424	÷18,392	÷760,518
Copper—kilograms. .	1,100	600			− 1,100	− 600
Non-metallic:						
Coal—metric tons . .	20,000	130,000	2,720	20,200	−17,280	−109,800
Clay products . . .		450,000		453,000		÷ 3,000
Lime		90,000		92,026		÷ 2,026
Sand and gravel . .		477,344		468,750		− 8,594
Stone		655,795		651,049		− 4,746
Salt—metric tons . .	18,333	550,000	19,147	574,511	÷ 814	÷ 24,511
Mineral waters—liters.	300,000	60,000	264,871	55,849	−35,129	− 4,151
Total. . . .		2,826,410		3,513,745		

a. One peso Philippine currency is equal to 50 cents United States currency.

IRON AND STEEL

Wakamatsu Iron Foundry.—If the reports by some Japanese papers be correct the Government has the intention of disposing of the Wakamatsu Iron Foundry on the ground that under its own management, it will not yield profits for some time to come. The *Niroku* declares Mr. Matsukata, president of the Kawasaki Dockyard in Kobe, has already made overtures for the purchase of the works by his company, which would find it convenient to have an iron foundry and he has some chance of success since the Kawasaki company through him assisted the Seiyukai in overthrowing the last Katsura cabinet.

On the other hand the Mitsui people are also after the foundry and the company has begun a canvass among the authorities concerned. Since the company already controls the Nippon Steel Foundry at Muroran as well the Hokkaido Colliery Company, it fears that the Wakamatsu iron foundry, if put under the management of the Kawasaki Dock, may prove a formidable rival to the Nippon Foundry.

The Hanyang Arsenal.—The situation of the Hanyang Arsenal could not have been better. It is in the midst of one of the world's richest iron districts, and it is so situated on the Yangtsze River as to make it accessible to both the east and west extremities of the country, while its close proximity to the Kin-Han Railway and the projected Yueh-Han Railway makes the transportation of finished products to the northern frontier and the southern coast a simple question. But during the Ch'ing Dynasty, no real effort was made by the authorities to make the plant efficient. It was allowed to drift along in an old rut without attempting to improve the equipment or increase the output. At that time, its output was limited to sixty rifles and 30,000 rounds of ammunition; per day and four 7.5 Centimetre guns per month. The necessary steel parts of the rifles and guns were purchased from abroad.

Since the Republican era, better men have been appointed to take charge of the work, and strenuous efforts have been made to increase the efficiency of the plant. A great increase in its output over that of the old regime is now recorded. The output at present is as follows: 200 infantry rifles per day; 100,000 rounds of ammunition per day; two 7.5 centimetre guns per week; 500 shrapnel shells per day; small parts of guns, 30 pieces per day. After the addition of new machinery, the arsenal will be able to make machine guns without getting the parts made abroad.

IRRIGATION, WATERWORKS, ETC.

Tokyo Waterworks.—The committee of the Tokyo City Council recently passed the proposal for the second period extension of the City's waterworks. The total expenditure required is estimated at 20,720,000 yen, spread over seven consecutive years. The source of the fund will be a loan and the reserve specially provided for the waterworks account, one-third of the total amount to be covered by subsidiary aid from the National Treasury. The loan is to be redeemed with proceeds from water supply. The resolution was then submitted to the meeting of the City Council and was passed in its original form.

Philippine Applications Granted.—The Philippines irrigation council has approved the application of the municipality of the San Pablo Electric Light Company for water rights for the installation of a plant on the Pagsipt river; the application from Tayabas for a hydro-electric plant; also the water rights desired by the bureau of education for the agricultural school at San Juan de Guimba. Nueva Ecija province, where the school proposes to irrigate an area of six million meters.

BUILDING, ETC.

New Manila Building.—The firm of W. H. Anderson & Co. at Manila is about to construct new reinforced concrete warehouses and bodegas on the site of the recent fire which destroyed the firm's old warehouses. The new building will extend from the Pasig river to calle Orozco. A passageway will extend clear through it from calle Orozco to the river, thus allowing an easy and expeditious transfer of goods from land to water and vice versa. All the latest improvements and features of design will be incorporated in the structure and its projectors say that it will be a model establishment of its kind. The estimated cost of construction is about P.60,000.

HARBOURS, DOCKS, ETC.

A New Mitsu Bishi Dock.—A big dock is now under construction by Mitsu Bishi & Co. at the island of Enoura in the Bakwan straits, at a cost of 100,000 yen and is to be completed in May or June, next year. The dock is said to be big enough for the repair of steamers of 3,000 tons or 4,000 tons.

Harbor Facilities at Newchwaug.—The Consular Body at Newchwang, at a recent meeting at the Japanese Consulate, resolved that the proposed improvement of the harbor facilities of the port of Newchwang should be urged upon the Chinese authorities for a speedy consummation. Reference was made at the meeting to the agreement recently reached at Chefoo between the Consular Body and the Chinese authorities there concerning the improvement of Chefoo Harbor, which has a similar bearing on Chefoo to that of the question at issue on Newchwang. In view of the existence of this precedent, the Consular Body, Newchwang, decided to disregard all objections raised by the Chinese authorities against its proposition, which was actually signed between them but has been deferred only in execution owing to the Revolutionary hubbubs.

Extension of Kawasaki Dock, Dairen.—The extension of the Kawasaki Dock, Dairen, which was taken in hand by the South Manchuria Railway Harbor Works authorities last April, is in good progress. The work of removing the lower steps of the dock has already been finished. The damming work out-side the mouth of the dock has been completed and the pumping-work been commenced. Unless something unforeseen happens, the work will be finished by the end of next October, as originally planned. On the completion of the work, the dockyard foundry as well as the machinery installed therein will be improved wholesale.

Projected Docks at Fusan.—A short time ago Mr. Saijo of Fusan planned the construction at Fusan of a dry dock capable of accommodating vessels of less than 1,000 tons at the cost of some 80,000 yen and filed an application with the Government-General for permission to start the work. It is reported from Fusan that a scheme for the construction of another dock is on foot. Chiefly interested in the scheme are Mr. Oh-ike and several other gentlemen connected with the Chosen Yusen Kaisha, and their idea in mooting the plan is to save expense incurred by sending the company's vessels for repairs to Nagasaki.

CEMENT

Japanese Cement Market.—The postponement of works by the Government, due to the policy of retrenchment was first expected to affect the condition of the cement market, but the fact was to the contrary, because the demand for cement in individual works has greatly increased of late. How prosperous is the condition of the market is to be seen from the expansion of business by manufacturers. The Nippon Cement Co. is setting up new machines at its factory at Yashiro, in Kyushu, and on its completion in October, the productive capacity of the company is expected to increase by 150,000 barrels in a year. The latest quotation of cement is 4 yen or so per barrel.

Hupeh Cement Works.—The Hupeh Cement Works at Shihhuiyao ceased work recently, it is said owing to the pressure of Japanese creditors. The works were started some six years ago. The plant is of the latest make, fully equipped in every detail for turning out cement of fine quality. The works are situated at the bottom of a hill of limestone and surrounded by other hills containing a practically inexhaustible supply of the same material. Several hundred men were employed, and in the works was an up-to-date barrel-making plant, and some time ago an electric trolley over-head system was devised by which the barrels of cement were transferred to a godown on the river bank. It is nothing less than a calamity that these works were closed. Many men are out of employment, and unless soon restarted much of the fine machinery will deteriorate.

There should have been plenty of trade owing to the building boom after the revolution, and probably local rumour is correct when it puts down the present state of things to "squeeze" and incapacity on the part of the Chinese managers. These were being constantly changed and were mainly without qualifications for the post. The inside management was controlled by three German engineers, one of whom erected all the machinery when the works first commenced. They were simply concerned with making the cement and were men of experience and ability. It is much to be hoped some way will be found for restarting what with proper management should prove a lucrative business.

Siam Cement.—Some time ago a proposal was put forward for the formation in Bangkok of a Cement Company for making cement from local materials, and practical steps have now been taken for the establishment of such a Company. The object of the Company is the making of good cement of materials to be found locally. Experiments have clearly demonstrated that cement of excellent quality and quite equal to the best Portland cement can be made in Siam.

LIGHT AND POWER

Kinugawa Water Power Co.—The semi-annual general meeting of the Kinugawa Water Power Co. was to be held on June 28 and a dividend of 6 per cent. was to be declared on the occasion for the last half year.

Nippon Gas Co.—At the general meeting of the Nippon Gas Company the following proposal for the distribution of profits will be submitted:—

Net profits	43,017.45
Brought over from last account	18,650.10
Total	61,667.55
Legal reserve	2,200.00
Bonuses	4,000.00
Funds for allowances for retiring employees	1,000.00
Dividend (7 per cent.)	32,000.00
Carried forward to next account	22,467.55

Electric Amalgamation.—In order to avoid unnecessary competition among Tokyo electric light suppliers, a movement has been quietly started for amalgamating into one concern all the interests now divided into five companies. The gas company is also being invited to join the movement. The most difficult to induce to join the amalgamation is the City Electric Light department. It is believed that the law in force has to be amended before the same department of the City can come in. On the

successful consummation of this undertaking, Mr. Abe, the ex-Governor of Tokyo-fu, will be appointed President of the big concern. Mr. Yasuda, who is the moving spirit of the Katsuragawa Hydro-electric, and Mr. Toshimitsu of the Kinugawa Hydro-Electric, are in full sympathy with the movement, while Mr. Satake, President of the Tokyo Electric Light Company,.is believed to be the originator of the movement. Consequently, the prospect of the movement is very promising, and the final consummation may be effected much sooner than is generally expected of a big business enterprise of the kind.

Electric Light Service for Chefoo.—The establishment of a lighting company at Chefoo has been matured at the initiative of the Chingkee Co. and other Chinese at Chefoo. It was to be capitalized originally at $100,000, but, as there are prospects of having a larger number of subscribers than at first calculated, it has been decided to increase the amount by $50,000. The plant is to be equipped with two generators, one of 300 kilowatts and the other of 200 kilowatts.

Keihin Electric Co.—The general meeting of the Keihin (Tokyo and Yokohama) Electric Tramway Company was to approve a dividend of 6 per cent. According to the report, the company has an increase of profit 20,000 yen as compared with the previous term and 25,000 yen will be placed on reserve fund.

Motor Power of Tokyo Trams.—The electric motor power of the tram system in Tokyo is to be entirely supplied by the Kinugawa Water Power Company. The system consumed 148,600 kilowatts on June 3, and 155,500 kilowatts on June 4.

Tokyo Electric Light Co.—The Tokyo Electric Light Company at its semi-annual general meeting will adopt a dividend of 10 per cent. for the last half year term.

Osaka Electric Light.—Negotiations have advanced, it is said, for the proposed municipalization of the electric light service in Osaka. The authorities of the municipality and the company met recently, when they signed a provisional contract. This provisional contract and the rules for the issue of a municipal loan for the purpose were to be discussed at a meeting of the Aldermanic Assembly. It appears that the contract may be passed by the Aldermanic Assembly and Municipal Council after all, but whether the Government will sanction it or not is doubtful, especially as the loan for the purchase is to be raised abroad and the Government does not like the importation of foreign capital for such a purpose. A certain Osaka paper, however, reports that anticipating the realization of the scheme, three plans are already proposed for the issue of the loan, whose amount is expected to be 50,506,000 yen; the first plan proposes a 5 per cent. rate and 83 yen of issuing price, the second a 5.5 per cent. rate and 90 yen of issuing price, and the third a 6 per cent. rate and 94 yen issuing price.

FINANCIAL

Shanghai Waterworks Co., Ltd.—In connection with the Shanghai Waterworks Company's issue of Tls. 100,000 6 per cent. debentures, applications were received for over two and a half times the amount. Seventy per cent. was allotted at 3½ per cent. premium, and the balance at 3 per cent. premium.

Penang Municipal Loan.—The Municipality of Penang is applying to raise a loan of One Million Dollars at 4%. It is proposed to devote the money to municipal purposes such as electric lighting, drainage and tramways.

The Sino-Japanese Corporation.—Japan's share in the stock of the projected Sino-Japanese Joint Corporation having all been taken up, a conference of promoters was held recently at the Imperial Hotal at Tokyo, Baron Shibusawa presiding. As the result of the conference a committee was appointed to undertake preparations for the organization of the company. It is stated that, as 18,000 shares of the Chinese half of the capital have not been taken up, it has been suggested that the unsubscribed portion should be taken up by Chinese in the north The Chinese capital hitherto subscribed had all come from the South.

Hongkong & Shanghai Bank.—The Hongkong and Shanghai Banking Corporation has declared, subject to audit, the following results for the half-year:—

Dividend	£2.0.0
Added to Silver Reserve..	$250,000
Written off Bank Premises Account	$250,000
Carried forward to next half year	about $2,050,000

Loan to Hunan.—Japanese financial circles have offered to the Tutuh of Hunan a loan to the amount of ten millions dollars against mortgaging all mines in the Province. *Chinese Report.*

China's Indebtedness.—Information from the Ministry of Finance, says the *Kuo Wei Pao*, states that since the conclusion of the Quintuple loan all accumulated foreign debts have been paid from the proceeds of the loan. Some time ago Mr. Liang Shih-yi, the Acting Minister of Finance, submitted a statement of account of debts which had fallen due, for the examination of the President, and after the latter's approval the account was handed over to the Quintuple Group for payment. The items paid are as follows:—

Box Indemnity for 1912.	£	2,000,000
1st Advance of the Sextuple Group	£	342,792
Interest at 7½% for above	£	3,200
2nd Advance of the Sextuple Group	£	158,558
Interest at 7½% for above	£	1,500
Belgian loan (1st instalment)	£	1,000,000
Interest for above ...	£	13,000
Belgian loan (2nd instalment)	£	250,000
Interest for above......	£	1,600
Advance of the Quadruple Group ...	£	400,000
1st payment of interest for above	£	33,139
2nd payment of interest for above	£	12,887
3rd payment of interest for above	£	1,100
3rd Advance of the Sextuple Group	£	455,236
4th Advance of the Sextuple Group	£	449,324
Total		..£5,223,338

Yokohama Loans.—The City of Yokohama will shortly float a loan amounting to 1,355,600 yen for the reclamation of the sea front of Negishi. In the same connection it may be interesting to note the actual amount of the loans issued by the Municipality since 1903. The City of Yokohama issued for the first time in April, 1903, a loan amounting to 556,500 yen for the improvement of roads and building of schools. The second loan was a sterling one of £317,000, which was issued in August, 1906, the proceeds being applied to the completion of works necessary to reclaim the foreshore and extend and develop the harbor of Yokohoma. In December, 1910, the Municipality issued a third loan amounting to 450,700 yen for the improvement of the city. Besides the above the Yokohama Municipal Water Works issued two loans for the extension of the works, the first in March, 1898, amounting to 2,055,600 yen and the second, a sterling loan, amounting to £716,500. The Yokohama Municipal Gas works also issued two loans for the extension of the works, one in April, 1909, amounting to 648,000 yen and the other in 1912 amounting to 1,200,000 yen. The total of Japanese Currency loans is 4,910,950 yen, and of the sterling loans £1,033,500.

The Industrial Bank of China.—The following announcement appeared in the *Daily Mail* of May 29:—The Articles of Association of the Banque Industrielle de Chine were approved of by the Government of the Republic of China on the 11th day of January, 1913, and are deposited with and can be seen at the Offices of M. Lavoignat and M. Moyne, Notaries in Paris, or at the Offices of Messrs. Ashurst, Morris, Crisp and Co., Solicitors, London.

The Banque Industrielle de Chine is formed in co-öperation with the Government of the Chinese Republic, which has undertaken to subscribe one-third of the Capital and had promised to give its assistance to the Bank in developing the natural resources of China.

The following are extracts from contracts dated 11th January, 1913, between the organisers of the Bank and the Government of the Chinese Republic:—

"The Government of the Chinese Republic undertakes to subscribe one-third of the shares of this Company and reserves to itself the right to subscribe afterwards, if it thinks fit, up to one-third of any increase of Capital which the Banque Industrielle de Chine may decide to create."

"The Government of the Chinese Republic approves of the Articles of the Banque Industrielle de Chine, as they have been submitted to it, and it has promised to assist the Banque Industrielle de Chine in all the operations which it may undertake in conformity with its powers."

The formation of the Banque Industrielle de Chine is based upon the employment of foreign capital in China in close and friendly co-öperation with the Government of the Republic, and the Government undertakes not to sell or transfer either the 1,000 Founders' Shares or the 20,000 Ordinary Shares subscribed by it during the first twenty-five years of the Bank's existence.

40,036 Ordinary Shares of Frs. 500 (of which Frs. 125 will be called up at once) have been reserved for subscription at par for the Shareholders of the Peking Syndicate, Limited, *pro rata* of their holdings, as follows:—

A.—Holders of 50 Shansi Shares will be entitled to 1 Banque Industrielle de Chine share.
Holders of 50 Ordinary Shares will be entitled to 1 Banque Industrielle de Chine share.
Holders of 1 Deferred Share will be entitled to 4 Banque Industrielle de Chine shares.
The Frs. 125 being payable on application; and

*B—Shareholders of the Peking Syndicate, Limited, will be entitled without reference to the amount of their holdings to apply for any number of shares in the Banque Industrielle de Chine on payment of Frs. 50 application, the balance of Frs. 75 being payable on allotment.

*C—The above shares are at the same time offered for public subscription on payment of Frs. 50 on application, the balance of Frs. 75 being payable on allotment.

*NOTE—*In each of these cases allotment will be made in accordance with the balance remaining unallotted under "A," preference being given to Shareholders of the Peking Syndicate, Limited.*

Forms may be obtained and applications will be received.—

In England at Lloyds Bank, Limited, 72 Lombard-street, E.C., and branches: and at the Offices of the Peking Syndicate, Limited, 110, Cannon-street, E.C.

In France at Société Auxiliaire de Credit, 13, Boulevard Haussmann, Paris, and Branches: at all Banks and Bankers.

In Belgium at Banque de Reports de Fonds Publics et de Depots, 48, Place de Meir, Anvers, and 81, Rue Royale, Bruxelles.

In Switzerland at MM. Ormond & Cie, Banquiers, 6, Place de la Synagogue, Geneve.
Dated 27th May, 1913.

Kawasaki Dock Loan.—The Kawasaki Dock at Kobe has decided to issue a loan of 3,000,000 yen at the rate of 7 per cent. The loan is to meet the fund necessary for the discharge of the increased business of the company, and will probably be issued in August. The company was to hold its semi-annual general meeting recently and declare a dividend of 8 per cent. for the last half-year term. The loan question was to be discussed on the occasion.

A Loan for Kiangsu.—The *Minlipao* reports that Tutuh Chen of Kiangsu was just upon the point of concluding a loan of $5,000,000 with Messrs. Carlowitz & Co., the terms, it is said, having been discussed and agreed to, when the Quintuple Loan agreement was signed in Peking. The Tutuh was in need of money to pay his troops, but as the Ministry of Finance had ordered him to abandon the local loan, promising him a sufficient amount out of the large loan to meet his military expenditure, he had refrained from taking further steps in this matter. As no money, however, has been sent to him from Peking, although the need of it to pay his men is more pressing than ever, he was obliged in June to send a deputy to Shanghai to see if the local loan may be concluded after all.

Osaka Electric Railway Debentures.—The Osaka Electric Railway Company's debentures of 2,000,000 yen have been put to the market at the rate of 8 per cent., and to be redeemed in 4 years, commencing one year after the issue.

Osaka Shosen Kaisha.—It is stated that the Osaka Shosen Kaisha will increase the present capital of 16,500,000 yen to 33,000,000 yen. This plan has been decided upon by the company owing to the business prosperity of the company in the American line. With this increase of the capital, the company will open a new line to Europe.

Loan for Shimonoseki.—The city of Shimonoseki has decided to issue a loan of 500,000 yen for harbor construction works.

A Japanese Bank in Hawaii.—Mr. Kenji Imanishi, being supported by Baron Shibusawa, Mr. Nakano, the president of the Tokyo Chamber of Commerce. Mr. Asano, the president of the Tokyo Kisen Kaisha, and some other businessmen, is planning to establish a bank in Hawaii with a capital of 200,000 yen for the benefit of the Japanese residents in Hawaii. It is said that one half the number of its shares is to be invited from among the Japanese in Hawaii, and the other half in Tokyo and Yokohama.

Keishi Railway Debenture.—The Keishi (Tokyo Narita) Electric Railway Company, at a recent directors' meeting, decided to issue debentures of 750,000 yen, probably in August.

Yokohama Dock Debenture.—Yokohama Dock Company through the medium of the 100th Bank, has recently concluded with Sale, Frazar & Co. a loan of 1,000,000 yen at a 7 per cent. rate.

Osaka Electric Railway Debentures.—The newly concluded Osaka Electric Railway Company debentures, 2,000,000 yen worth is to be put on the market. The rate of interest is 8 per cent. per annum.

A Loan for Beppu.—The town of Beppu Japan, which is noted for its famous hot springs, has decided to raise a loan of 485,000 yen for the construction of water works and improvement of streets.

COMPANIES

Fuji Cotton Spinning Co.—At a general meeting of the Fuji Cotton Spinning Company a dividend of 12 per cent. was to be declared. The statements of accounts is as follows:—

Net profit for the present term	1,370,812
Carried foward from the previous term	551,011
Total	1,921,823
Legal reserve	68,540
Reserve for loss	68,540
Bonus and relief for workmen	68,540
Pension fund	68,540
Dividend (12%)	696,000
Carried over	883,123

Cathay Trust, Ltd.—The directors recommended that the available balance at credit of profit and loss account for the financial year ended April 30, 1913, amounting to Tls. 338,590.95 be appropriated as follows:—

	Tls.
To pay a dividend of 6% on the preference shares at ex. 2/9 1/16 (Tls. 0.40) per share	120,000.00
To pay Tls. 0.45 per share on the ordinary shares equivalent at ex. 2/9 1/16 to a dividend of 10% with a bonus of 52% added	135,000.00
To carry forward to next year	83,590.95
	Tls. 338,590.95

Japanese Insurance Co.—At the Imperial Marine, Carriage, and Fire Insurance Company's general shareholders' meeting the following profit and loss accounts were taken up for discussion:—

	Yen.
Legal reserve	20,000.00
Secondary reserve	100,000.00
Loss reserve	50,000.00
Bonus	15,600.00
Dividend (15 per cent.)	112,500.00
Carried over to next term	88,564.59
Total	386,664.59

Japan Paint Manufacturing Co.—The Japan Paint Manufacturing Company at its ordinary meeting passed the following accounts:—

	Yen.
Net profit	96,027.06
Brought over from last account	32,837.34
Total	128,864.41
Legal reserve	4,802.00
Reserve for buildings and machinery	20,000.00
Second reserve	10,000.00
Bonuses	9,602.00
Dividends (10 per cent.)	48,333.33
Carried forward to next account	36,127.08

The "Star" Ferry Co. Ltd, Hongkong.—The report of this Company for the year ending 30th April, 1913, states:—

Accounts.—The nett earnings of the boats, after paying all working expenses, amounted to $78,780.46 as against $55,850.94 the previous year.

The amount at credit of profit and loss account (after paying for repairs, allowing for directors' and auditors' fees and placing $4,615.05 to credit of insurance fund), including $522.01 brought forward, is $75,972.96, which, with the approval of shareholders, it was propsed to appropriate as follows:—

To write off Ice House Street Pier	$ 5,923.72
To pay dividends as follows:—	
$2 per share on 1st issue (10,000 shares)	20,000.00
$1.75 per share on 2nd issue (10,000 shares)	17,500.00
$1 per share on 3rd issue (10,000 shares)	10,000.00
To transfer to reserve fund	13,254.06
To carry forward	9,295.18
	$75,972.96

Oriental Confectionery Co.—At the general meeting of the company the following profit and loss account was passed:—

	Yen.
Profits	12,900
Brought over from last account	4,450
Total	17,350
Reserves and Bonuses	5,000
Dividend (10 per cent.)	8,000
Carried forward to next account	4,360

Prosperity of Japanese Spinning Companies.—Spinning companies have had, it is said, very prosperous times in these months, due to the increased exportation of their products, though raw cotton was comparatively high. Thus it is said that during the first six months of this year, the Settsu spinning will realize after all a profit of 1,200,000 yen, the Amagasaki that of 900,000 yen, the Nippon that of 700,000 yen, the Osaka that of 700,000 yen, the Fukushima that of 500,000 yen, and the Kanegafuchi that of 2,000,000 yen, and other companies will also realize more or less increased profit. And these companies with this increased profit are expected to be able to declare an increased rate dividend for the said semi-annual term, these rates probably ranging from 10 per cent. to 18 per. cent or so.

New Japanese Spinning Company.—A new spinning company will shortly be established with a capital of 1,000,000 yen under the name of "Kii-Boseki Kaisha," the promoters being Mr. Kichibei Murai, Mr. Kumisuke Okazaki, M.P., of Tokyo, Mr. Seibei Fujimoto, Mr. Hirozo Yanagi of Osaka, and some others.

Tokyo Dento.—The Tokyo Dento (Electric Light) Company at its semi-annual general meeting was to declare on the occasion a dividend of 10 per cent. for the last half year term.

New Japanese Life Insurance Co.—A new life insurance company bearing the name "Chuwo Seimei Hoken Kaisha" was organized recently with a capital of 500,000 yen, the promoters being Messrs. Kinroku Ono, Torajiro Ikeda, and Ryohei Mokoshi and some others.

Nisshin S.S. Co.—The Nisshin S.S. Company, at its semi-annual general meeting was to adopt a dividend of 8 per cent. on its shares for the latter half of the fiscal year 1912-13.

Kyushu Colliery S.S. Co.—The Kyushu Colliery S.S. Company at its semi-annual general meeting was to declare a dividend of 4 per cent. The low rate of dividend is due to the fact that the company has had to pay the 7 per cent. interest on its debt of 1,000,000 yen to Mitsu Bishi & Co.

Rock Candy Mfg. Co.—A new company was established recently in Osaka with a capital of 500,000 yen for the manufacture of rock candy, mainly to be exported to Shanghai.

Sanyo Spinning.—The Sanyo Spinning Yarn Co. at its semi-annual meeting was to adopt a dividend of 8 per cent. for the last half year term.

Yokohama Fish Oil.—The Yokohama Fish Oil Company has decided to double its capital of 500,000 yen for the expansion of its business.

Shinyei Kaisha.—The Shinyei Filature Company at its general meeting adopted a dividend of 10 per cent. for the last half year term.

Japan-China S. S. Co.—The Japan-China Steamship Company at its semi-annual general meeting adopted a dividend of 8 per cent.

Butler Cement Works.—The A. Butler Cement Tile Works' (Shanghai) statement of accounts and balance sheet for the year ended March 31st, 1913, states that Sh. Tls.

The year's working shows a profit of	2,862.51
To which interest on cash with Bankers and Transfer Fees have to be added..	22.66
	S. Tls. 2,885.17

From this profit allowances for Depreciation as follows have been made:—

	Tls.	Sh. Tls.
Plant and Machinery	808.15	
Buildings	450.00	1,258.15
Leaving a surplus of		1,627.02
Deducting this from the balance at Debit in Profit and Loss Account on 31/3/1912.		5,371.78
Leaves a Debit Balance in Profit and Loss Account of S. Tls		3,744.76

Shanghai Electric and Asbestos Co., Ltd.—The statement of accounts for the twelve months ended February 28, 1913, shows that there was a restricted volume of business. The loss on the year's trading was $12,842.38, which, with the addition of $1,717.80 to the provision for bad and doubtful debts, $218.55 written off Furniture and Fixtures and $1,117.00 written off certain items of machinery in stock, made a total of $15,895.73. Against this was the balance of the Reserve Fund $5,058.72, which leaves the sum of $10,837.01 to be carried forward as a charge against the current year's working. With regard to the Shroff Suspense Account, this has been reduced by $5,653.91, and securities are held to the value of $2,297.30.

Sino-Japanese Company.—The organization of the Chugoku Kogyo Kaisha (Chinese Industrial Company) is progressing satisfactorily, says the *Teikoku Tsushin*. The organization of this company had its inception in the recent visit of Sun Yat-sen, who proposed, in co-operation with Baron Shibusawa and a few other business men here, to organize a Sino-Japanese company with a capital of 5,000,000 yen, to be subscribed equally by the Japanese and Chinese. The new company is to absorb the Toa Kogyo Kaisha (East Asia Industrial Company). The allotment of the capital among prospective shareholders is said to have been completed.

The Japanese shareholders include the Mitsui, Mitsu Bishi, Taiwan, Yokohama Specie, Hundredth, Fifteenth, Industrial, Yasuda, and First Banks, Toa Kogyo Kaisha, Baron Shibusawa, Baron Kondo, Mr. Okura and other business men in Tokyo, Yokohama, Osaka, and Kobe.

The Chinese shareholders include Sun Yat-sen, and prominent business men in Shanghai, and the Chinese shares of 2,500,000 yen have been entirely taken up. The shares have been divided among several business men in North China, and the enterprise is a purely business proposition, not to be affected by any political changes in China. The allotment of the capital having been already decided upon, it will not be offered to the publie for subscription.

Another report states that the Chinese half of the capital has not yet been subscribed.

Naikoku Tsuun.—The Naikoku Tsuun Kaisha (Home Transportation Co.), Japan, at its general meeting adopted a dividend of 12 per cent. for the last half year term.

Osaka Flour Mill.—The Osaka Flour Mill Company was to declare a dividend of 18 per cent. for the last semi-annual term.

Kanegafuchi Spinning.—The Kanegafuchi Spinning Yarn Company at its general meeting to be held on June 22 was to declare a dividend of 16 per cent. for the last semi-annual term.

Shanghai Mercury, Ltd.—The report of the directors for the year ended April 30, 1913, stated that after writing off Tls. 2,046.56 for depreciation and providing for directors' and auditors' fees and writing off bad and doubtful debts, there remained a credit balance of Tls. 3,541.93 in the profit and loss account, out of which the directors proposed to pay a dividend of 3 per cent. for the year, absorbing Tls. 3,150, and to carry forward the balance of Tls. 391.93.

S. Moutrie & Co., Ltd. (Shanghai).—The report of the directors for the year ended March 31, 1913, stated that the net profit, after deducting the debit balance, brought from last year of $5,202.17, amounted to $24,367.47, which sum the directors recommended be divided as follows:—To pay a dividend of 5 per cent. $15,420.00; commission to managing director $771.00; and carry forward to new account $8,476.47.

Nippon Yusen Kaisha.—At the general meeting of shareholders of this company a dividend of ten per cent. was declared, and the distribution of profits was approved as follows:

	Yen
Brought over from previous term..	813,723.99
Net profit	2,989,680.66
Total	3,803,404.65
Reserve	149,484.03
Reserve against deduction of subsidy	98,474.56
Fund for extension of service and improvement of fleet	700,000.00
Reserve for construction and repairing of buildings..	500,000.00
Other reserve	300,000.00
Allowance to directors and auditors	73,555.00
Dividend (10 per cent. per annum)	1,100,000.00
Carried forward to next term ..	881,891.06

The following review of the company's business was submitted to the shareholders:

Between October 1, 1912, and March 31, 1913, the company used 81 steamers of its own, aggregating over 330,000 tons, in addition to two specially commissioned vessels, representing more than 8,000 tons, and several chartered steamers. The passengers carried in the term were 103,000, and the cargo transported was 2,000,000 tons, the distance covered by the fleet was 1,790,000 miles.

The Hanyehping Co.—An ordinary meeting of the shareholders of the Hanyehping Corporation was held on May 20 at Shanghai. The number of shareholders present was 917.

Mr. Wang Tsung-shan, who presided, said that Mr. Chow Chiu-cheng, representing Mr. Sheng Hsuan-huai, would report to the meeting the result of the working during 1911 and the present position of the Corporation.

Mr. Chow then said:—I am not so well acquainted with the Corporation's affairs as I could wish to be. However, one fact must be brought forward, that the Corporation is in a very critical condition, and, unless reform measures be speedily adopted and carried out, and extravagant and wasteful habits be energetically suppressed, it may be too late to save it from a catastrophe. Another important matter to which I wish to call your attention is the want of a spirit of harmony among our co-workers. I joined the Board fifty days ago. I now know that it has been due to the support strenuously given by the Ministry of Industry and Commerce and the protection afforded by the two Tutuhs of Hunan and Hupeh, that the Pinghsiang mines have remained intact even to-day. At one time, a strong force was sent to the mines by the Hunan Tutuh, for our property was in great danger. On two other occasions he lent money for our men's sustenance.

He then expressed the hope that the Ministry of Industry and Commerce and the Tutuhs of Hunan, Hupeh and Kiangsi would continue to give their support and protection to the Corporation to the same extent as before, which, however, was far beyond what a private company should expect.

The accounts for 1911 were then read by the chairman. He said that at the outbreak of the revolution, the foreign hands were all paid off and escorted by the Wuchang authorities out of the danger zone. During the war between south and north, the iron was used in making defensive walls and on boilers and other machinery, guns were placed in position, so that much damage was done to the Hanyang property. He regarded it as fortunate that all the books were preserved. The receipts on account of sales at Hanyang and Tayeh in 1911 amounted to over Tls. 3,804,000, or over Tls. 147,000 less than the amount of income for the previous year, in spite of the handsome figure derived from the sales of raw iron and mineral ores, which gave the company over Tls. 553,000 more than that in the previous year's result. He explained that this was due to the great shrinking in the sale of steel goods since the revolution.

The income at the Pinghsiang mines was over Tls. 2,714,000, or some Tls. 1,145,000 less than the income of 1910. The coal and coke of the Pinghsiang mines was mostly sold to the Hanyang Ironworks; so when the latter stopped working, no other market was open to the mines.

The expenditure in 1911 was over Tls. 5,883,000 at Hanyang and Tayeh, or a saving of over Tls. 1,215,000 in comparison with the expenditure of the previous year: and over Tls. 3,846,000 at Pinghsiang or Tls. 541,000 less than the figure of 1910. The Chinese custom of paying interest on the capital to shareholders was adhered to, by the issue of extra shares to the shareholders in lieu of cash payment, to go over the books for 1911.

Yokohama Fire Insurance Co.—This company made a profit of Y300,551.47 for the last term, paid a dividend of 13 per cent. and carried forward Y106,051.49.

Tokyo Iron Works Co.—This company made a profit of Y24,480.30 for the last term, paid a dividend of 6 per cent. and carried forward Y6,689.97.

Tokyo Stock Exchange.—This company made a profit of Y508,782.56 for the last term, paid a dividend of 12 per cent. and carried forward Y677.36.

Fuji Paper Mill Co.—This Compay made a profit of Y395,628.90 for the last term, paid a divident of 8 per-cent. and carried forward Y96,694.44.

Tokyo-Narita Electric Tramway Co.—This company made a profit of Y24,427.21 for the last term, paid a dividend of 5 per cent. and carried forward Y3,997.98.

Osaka Shosen Kaisha.—This company made a profit of Y3,412,000 for the last term, paid a dividend of 10 per cent. and carried forward Y353,000.

Tokyo Rice and Merchandise Exchange.—This company made a profit of Y176,604.62 for the last term, paid a dividend of 14 per cent. and carried forward Y4,957.24.

Dai Nippon Sugar Refining Co.—This company made a profit of Y1,239,498.17 for the last term, paid a dividend of 6 per cent. and carried forward Y519,373.17.

Japan Flour Mill Co.—This company made a profit of Y116,710.55 for the last term, paid a dividend of 12 per cent. and carried forward Y43,680.82.

Nippon Gas Co.—This company made a profit of Y43,017.45 for the last term, paid a dividend of 7 per cent. and carried forward Y32,-467.55.

Tokyo Electric Light Co.—This company made a profit of Y1,950,261.21 for the last term, paid a dividend of 10 per cent. and carried forward Y450,255.01.

Hakodate Water Power Company.—This company made a profit of Y57,504.48 for the last term, paid a dividend of 10 per cent. and carried forward Y13,542.07.

Tokyo Calico Weaving Co.—This company made a profit of Y126,895.39 for the last term, paid a dividend of 10 per cent. and carried forward Y19,129.33.

Sino-Japanese Flour Mill Co.—This company made a profit of Y80,518.92 for the last term, paid a dividend of 10 per cent. and carried forward Y42,027.87.

Kyushu Water Power Co.—This company made a profit of Y72,518.50 for the last term, paid a dividend of six per cent. and carried forward Y69,366.72.

Yokohama Electric Tramway Co.—This company made a profit of Y146,941.92 for the last term, paid a dividend of 8 per cent. and carried forward Y1,009.20.

Shanghai Dock and Engineering Co., Ltd.—The report of the directors for the year ended April 30 last stated that the net profits, including the amount brought forward from last year, and after paying all charges and allowing for all known liabilities amounted to Tls. 180,116.29. This amount the directors recommended be dealt with as follows:—

Dividend of Tls. 3 per share, absorbing Tls. 165,600.00, and carry forward to new account Tls. 14,516.29.

Indo-China Steam Navigation Co., Ltd.—The report of the directors for 1912 stated that the anticipation expressed last year of a good year's trade in China has been realized. The volume of trade on the Indo-China section has also been very heavy, but the continued keen opposition there has severely militated against profits. Except for this latter circumstance the earnings for the year under review would probably have been exceptionally good. The credit side of the revenue account (including £7,530 15s. 7d. brought forward) amounts to £116,521 14s. 5d.; and after allocating £54,140 8s. 8d. to depreciation, writing off £2,000 from expenses of debenture issue, and providing for all outgoings, there remains a balance of £39,836 15s. 7d. Out of this, arrears of preference dividends amounting to £14,876 14s. od were paid in April last. From the balance remaining, viz., £24,960 1s. 7d. it is proposed to pay the dividend of 6 per cent. on the cumulative preferred shares for the year 1912, which will absorb £14,876 14s. od., leaving £10,083 7s. 7d. to carry forward.

THE BRITISH CIVIL SERVICE ESTIMATES.

The British Civil Service Estimates for the year ending March 31st, 1914, have been issued, and we give below the usual details concerning the votes relating specially to China, Japan, and the Far East. The figures enclosed in parentheses are last year's votes, and are given for purposes of comparison.

DIPLOMATIC AND CONSULAR BUILDINGS.

Under the heading of "New Works, Alterations, Additions, and Purchases (including Furniture in connection therewith)," are the following votes:—Bangkok: Sanitary works, £480. Changsha: Erection of new Consulate, £300; Dairen: Erection of new Consulate, £4,000 (£2,000), out of estimated cost of £7,500, leaving £1,500 required for completion. Hakodate: Rebuilding Vice-Consulate, £2,000 (£2,000) to complete; Shanghai: Erection of new stables, £600 (further required to complete £650); additions to Supreme Court and Consular offices, £1,000 (£3,000) to complete; Swatow: Rebuilding Consular jetty, £850; Hankow: Rebuilding servants' quarters and stables, £1,200; Osaka: Acquisition of site and erection of Vice-Consulate, £500 (£4,000 required to complete); Peking: Provision of water supply, heating system, etc., etc., £5,500 (£1,200 required to complete); Peking Erection of houses for Chinese Secretary and Commercial Attaché, £5,000 (£2,000 required to complete); Peking; Sanitary alterations, etc., etc., £1,500; Shanghai: Installation of baths, etc., at Consular Jail, £140. Acquisition of new sites in China, Japan, and Korea, £500. The maintenance of buildings in the Far East is included in a general vote.

PERSONAL

Herr Knipping has taken over the duties of German Consul-General at Shanghai.

Dr. Behrend, of the Mannheim Commercial High School, has been appointed adviser to the South Manchurian Railway to succeed Professor Wiedfeld.

Herr Bauer, a German subject, has been appointed by the President to be his "Adviser for Technical Questions."

Mr. Arnhold, a German subject, has been appointed Adviser of Banking Affairs to the Ministry of Commerce and Industry.

Mons. R. J. Audap, the new manager of the Banque de l'Indo-Chine at Tientsin, has arrived and taken over from Mons. Bazen. Mons. St. Pierre replaces Mons. Casenave at Peking, the latter being now on leave.

Mr. C. M. Bishop, of the American Consulate at Tientsin, has been transferred to Chefoo as Vice-Consul. Mr. G. F. Bickford has been transferred to Newchwang as Vice-Consul and Mr. C. P. McKiernan has been transferred to the American Consulate at Shanghai, whither also Mr. J. Davies has been transferred.

Mr. Yamaza has succeeded Mr. Ijuin as Japanese Minister in Peking.

Mr. A. C. Eriksen, Chief Accountant of the Great Northern Telegraph Company in Shanghai, has been appointed adviser to the Chiaotungpu (Ministry of Communications) on telegraph affairs. He has abready assumed his duties.—

Dr. Hauer, Second Chinese Secretary of the German Legation, has returned to Peking.

Herr Stolle of the German Consular Service, has returned from leave, and has been appointed to Mukden.

The Chinese Government Railways

Tientsin-Pukow Line

In addition to the bi-weekly express and daily local service, which shall continue unaltered, a daily direct through service from Pukow to Tientsin and *vice versa*, will be inaugurated from the 1st of May, 1913, with first, second and third class passenger cars but no sleeping cars attached. Dinner service will be provided.

From same date booking for third class passengers on express trains will be discontinued, but a first class passenger may book not more than one-third class servant ticket for which accommodation will be provided.

TIME TABLE

UP TRAIN.

STATIONS		Mon. & Fri. Express	Daily Through Mail Service
Pukow	Dep.	9.00	9.40
Hsuchowfu ..	"	17.44	19.44
Tsinanfu	"	2.30 Tues. & Sat.	7.00 next day
Techow	"	5.31	9.55
Tientsin Cen..	Arr.	10.43	15.35
" "	Dep.	10.53	16.05
Tientsin East.	Arr.	11.03	16.15

DOWN TRAIN.

STATIONS		Wed. & Sat. Express	Daily Through Mail Service
Tientsin East.	Dep.	13.00	9.40
Tientsin Cent.	Arr.	13.10	9.50
" "	Dep.	13.20	10.20
Tsinanfu	"	21.54	19.30
Hsuchowfu ..	"	6.41 Thurs. & Sat.	7.05 next day
Nanhsuchow..	"	pass	9.03
Pukow	Arr.	15.15	16.41

For further particulars apply to the Traffic Manager.

BY ORDER.

The British Engineers Association

London Office, Caxton House, Westminster.

Peking office to be opened on 1st August at the house recently occupied by Messrs. Wardroper and Co., in the

Wang Fu Ching Ta Chieh.

Enquiries to be addressed to:—

Capt. T. C. FitzHugh, M. V. O.
Chief Commissioner.

ALPHABETICAL LIST OF ADVERTISERS

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Anderson & Co., W. H.

Alcohol Distillers
Cia. General de Tabacos de Filipinas.
Ynchausti & Co.

Anti-fouling Composition
J. Dampney & Co.

Banks
Deutsch-Asiatische
Hongkong and Shanghai Banking Corp.
International Banking Corp.
Banco Español Filipino
Russo-Asiatic Bank

Boilermakers
A. F. Craig & Co.

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White & Co., Inc., J. G.
Shanghai Dock & Engineering Co., Ltd.
Strauss, Bascule Bridge Co.
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Malthoid Paraffine Paint Co.
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Bellis & Morcom, Ltd.
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Melchers & Co.

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Shanghai Machine Co.
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THE FAR EASTERN REVIEW

COMMERCE :-: ENGINEERING :-: FINANCE

VOL. X. SHANGHAI AND MANILA, AUGUST 1913 No. 3

PEKING-KALGAN-TATUNG-FU RAILWAY

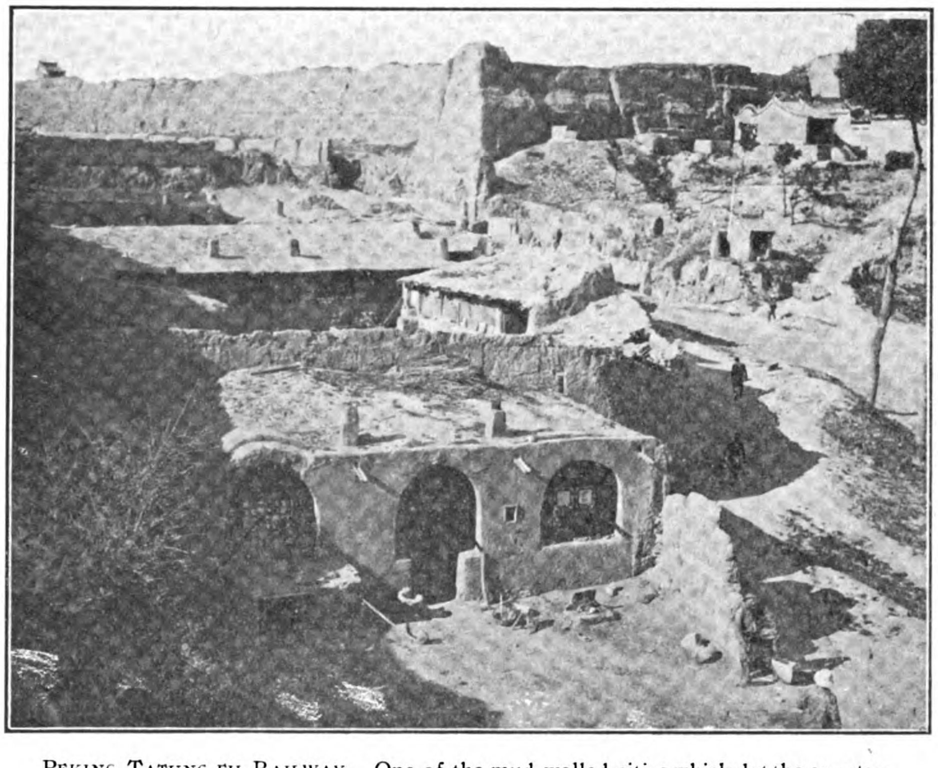
WORK ON THE CHANGSUI EXTENSION

Construction work on the extension of the Kalgan line to Tatung-fu has progressed so well during recent months that the Engineer-in-chief, Mr. K. Y. Kwong, is hopeful of seeing railhead at the river opposite Tatung-fu, in north-eastern Shansi, by October of this year.

The financial difficulties confronting the Government will no doubt lead to an abandonment for some time of the original idea of pushing the line through to Sui-yuan in the north-western corner of Shansi, close to the Mongolian frontier.

At present the extension is open to traffic as far as Yangkuohsien, some 80 miles from Kalgan. The total length of the line from Peking to Yangkuohsien is 204 miles. Tatung-fu is out 20 miles from Yangkuohsien, giving a total of some 224 miles. This is the longest stretch of railway in the country built solely by Chinese engineers with Chinese capital and operated by Chinese railway men.

It is an important route which opens up the vast cereal producing lands of the north of Chihli and Shansi provinces, and brings the products of the rich rolling downs of Inner Mongolia in touch with valuable markets. Already the line has had a marked effect upon the development of the country through which it passes, and was the means last year of taking about a million sterling into Shansi in return for products shipped to southern markets. Such a thing had never been dreamt of by the farmers, and they now look forward to greater returns as facilities are developed. In the March issue of the FAR EASTERN REVIEW (pages 456-457) special mention was made of this encouraging effect of the construction of the line.



PEKING TATUNG-FU RAILWAY.—One of the mud-walled cities which dot the country in North Shansi. The walled city is in the back-ground. The houses in the fore-ground are built of mud in a loess chasm.

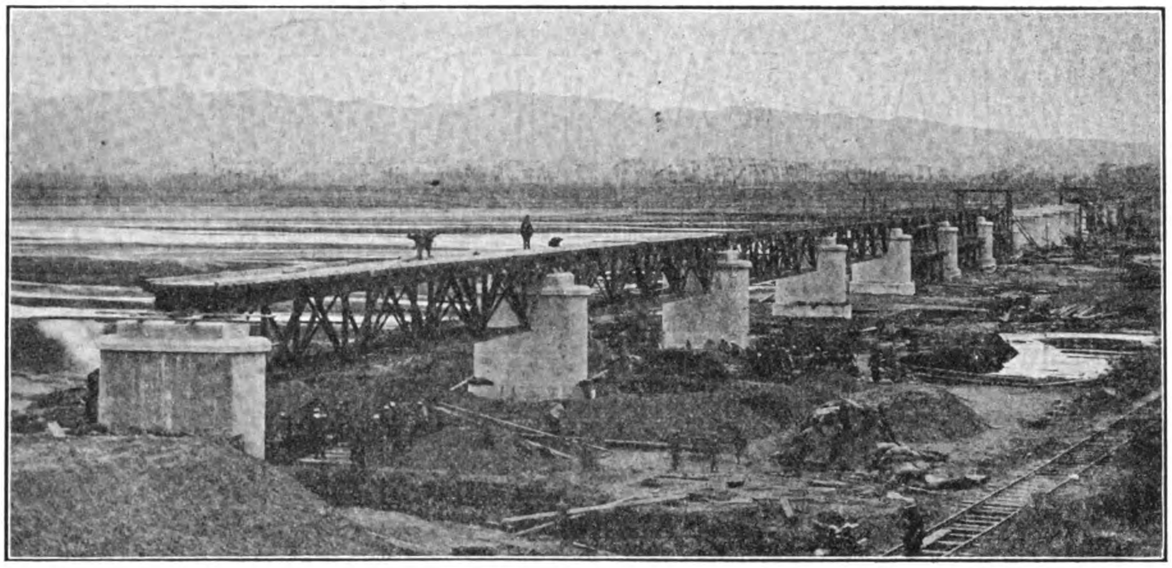
Recently a representative of this journal journeyed as far as Tatung-fu and found the construction work well in hand. The engineers were extremely keen, and had solved the various problems which confronted them in a highly creditable manner. There was no slumming ; no leaving of things to chance—and perhaps excessive care was exercised in those territories where heavy rainfalls are destructive, to preserve the line from the ravages of flood. Usually the Chinese are credited with erring on the wrong side in this respect, but not so Mr. Kwong and his associates. In their embankments, their bridges and waterways they have proceeded only after most minute investigation, and have allowed for most abnormal flood visitations. The levels, too, were adopted only after exhaustive surveys. Faced with heavy gradients and varying country—a rise almost the whole way from Kalgan—they were compelled to be cautious to adopt none but a route that would give not only a minimum in grade but also a minimum in cutting, and much time and labor were spent in this connection. A maximum grade of one in one hundred and thirty was ultimately secured, with a minimum curve radius of 1,500 feet.

At a point near Tatung the line reaches a height of 4,000 feet above sea level, the up grade from Kalgan being continuous for 90 miles. Then there is a drop to Tatung-fu, which is 3,445 feet above the sea.

Altogether the waterway provided for on the extension totals on the first division 9,310 feet and on the second division some 5,695 feet.

The longest bridge is over the Yu river, seventeen spans of 100 feet each being required to cross to Tatung-fu. Across the Ta-yang river there is a bridge of 17 spans of 100 feet each ; the river at Kalgan, is crossed by five 100 feet spans, while the Yangho is also crossed by a bridge of similar length. These are the most important bridges on the line, but in several places large concrete culverts have been built to carry embankments across the loess chasms.

Cuttings vary from 60 feet downwards. They are mostly on the first division of the line ; while the second division is characterised by embank-



Construction of the Ta Yang-ho Bridge

ments, the highest running to 60 feet. The most difficult of these have been necessitated by loess gulches with which the country is scored.

The track is of standard gauge with an 85 lb. rail, chiefly the product of the Hanyang ironworks at Hankow, on the Yangtsze River.

The sleepers are Japanese hardwood.

Stations are about ten miles apart, and at every station water tanks have had to be provided in case of emergency owing to the scarcity of water. The station buildings have been built on the plans of those of the Kalgan line.

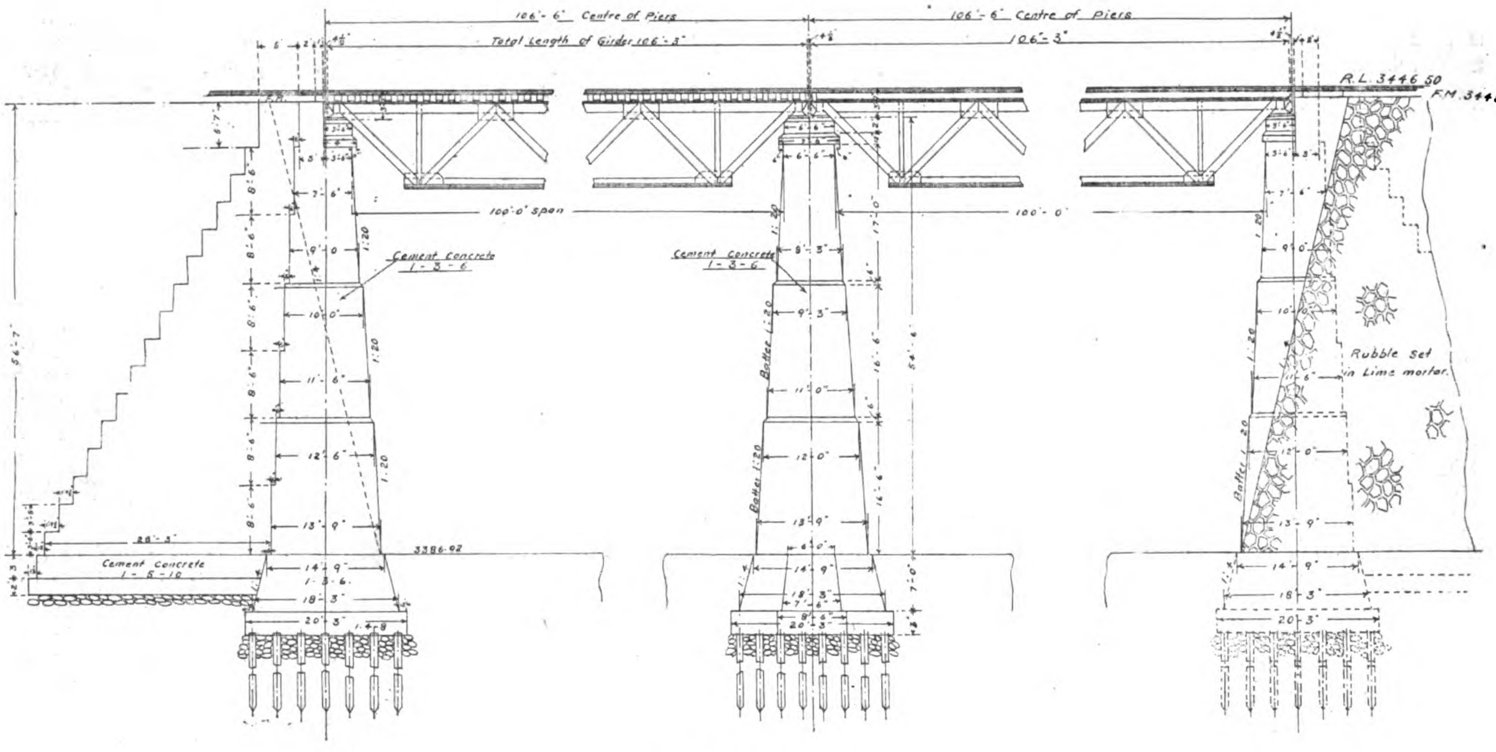
The Changsui Extension is a continuation of the Peking-Kalgan line and derives its name from the first syllable of Changkiakow (the Chinese name of Kalgan) and the first syllable of Suiyuan, in north-western Shansi, the objective of the line.

Survey work on the first portion of the route began in September, 1908, and by September, 1909, the line was located for a distance of fifty miles, as far as Tiencheng.

Construction work was commenced in April, 1910, and railhead reached Tiencheng in June of 1911.

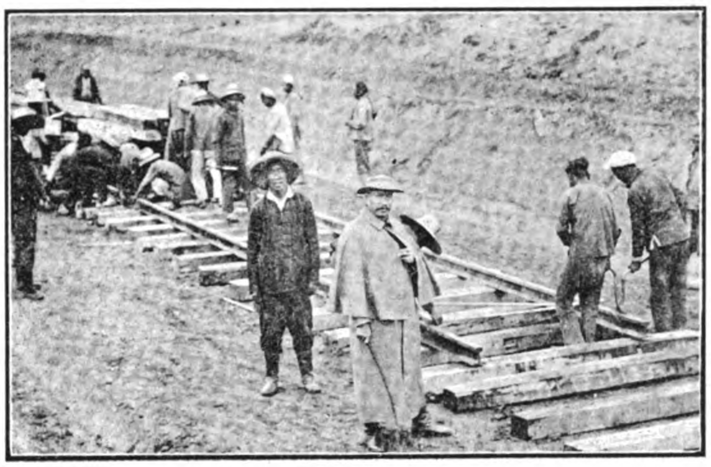
Mr. Jeme Tien-yu, who was the chief engineer of the Kalgan line, was in charge of the work on the extension until this time. He was then transferred to Canton; work having been suspended on the extension owing to a change of policy on the part of the then Minister of Communications, Mr. Tang Shao-yi. Mr. Tang felt that the money necessary for the continuation of the line to Suiyuan, or even Tatung, could be better utilised on a line from Kaifeng to Haichow, and when the construction work to Tiencheng was finished the workmen were disposed of.

However, the departure of Mr. Tang Shao-yi from the Ministry of Communications, and the appointment of

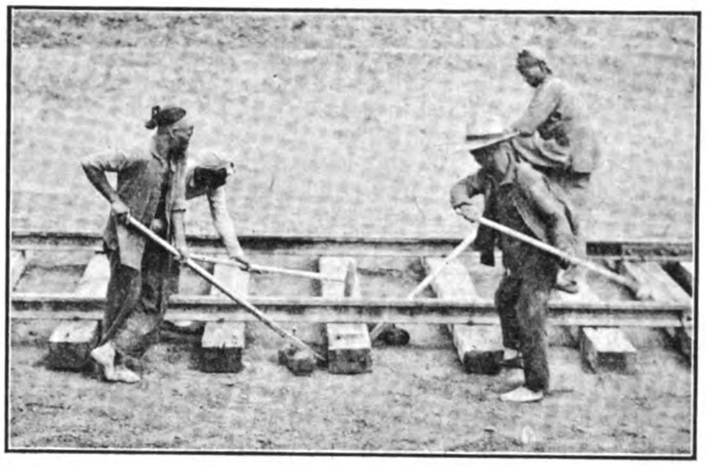


Tatung-fu Bridge

Side elevation of the bridge now being constructed across the Yu River at Taiyuan-fu. It is estimated the concrete necessary for the piers and abutments will be something like 350,000 cubic feet. The total weight of one pier is calculated at 1,299.745 tons, made up of concrete, 1,018.105 tons; track, 92.64 tons; girders, 37 tons; rolling load, 213 tons. The bearing on each pile is calculated at 15.45 tons where there are 34 piles to a pier, and 17.07 tons where there are 76 piles.



PEKING-TATUNG-FU RAILWAY.—Railhead—Mr. K. Y. Kwong, Engineer-in Chief, in foreground

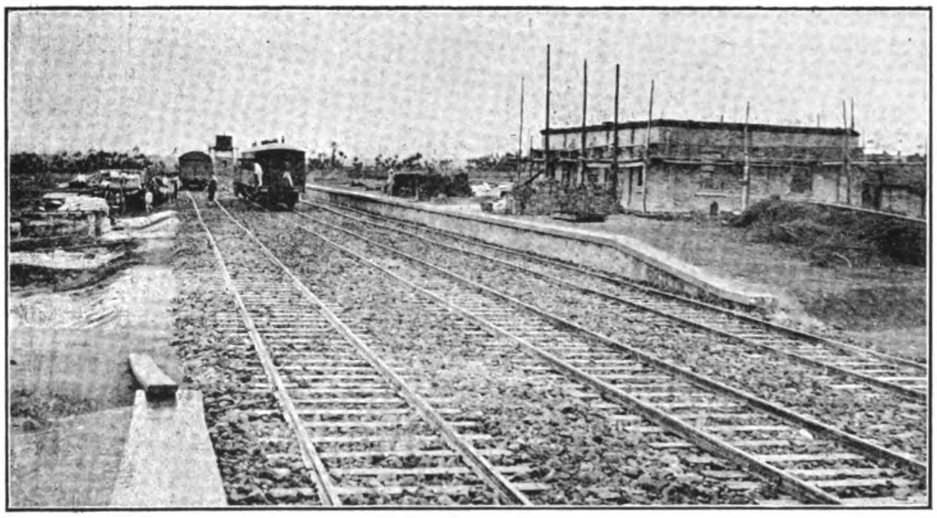


PEKING-TATUNG-FU RAILWAY.—Spikedrivers at work

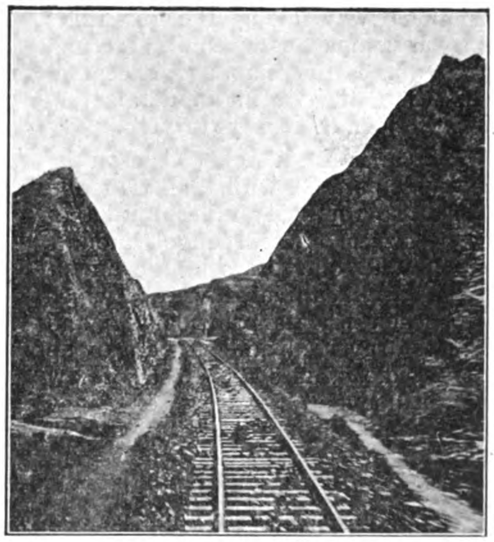
Mr. Chen Shi-lin, Assistant Engineer-in-Chief, Changsui Extension

Mr. K. Y. Kwong, Engineer-in-Chief, Peking-Kalgan-Tatung-fu Railway

Mr. Chai Chao-tin, District Engineer, Changsui Extension



PEKING-TATUNG-FU RAILWAY.—The station and yard at Wang-kun-jen-tun, in course of construction



PEKING-TATUNG-FU RAILWAY.—Rock cutting on the bank of the Yang River

Mr. Shen Kung-pao to succeed him, saw a reversal of orders, and after nine months of idleness work was resumed. By October, 1911, the survey had been completed from Tiencheng to Tatung-fu, so when orders were given for a resumption of work in July of 1912 the location was speedily carried out and workmen were engaged at different localities in August.

Mr. K. Y. Kwong was then placed in charge of the extension, and he has held that position ever since with marked ability—as well as being Engineer-in-Chief of the Peking-Kalgan Line.

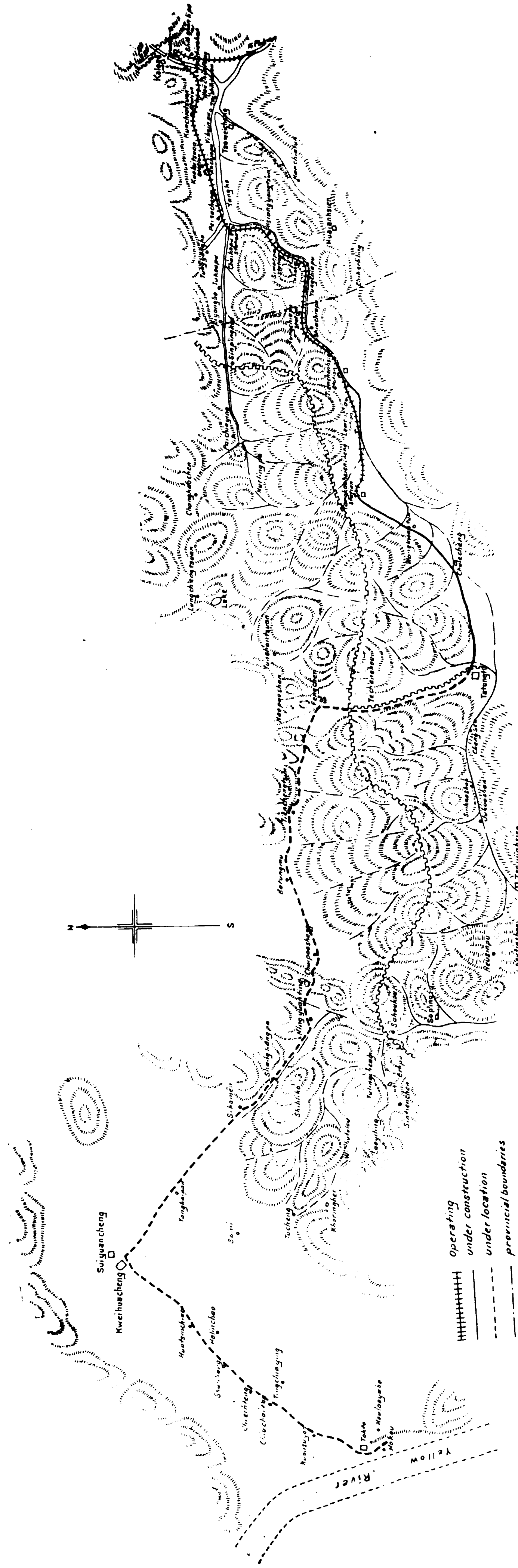
By November of 1911 railhead had reached Yangkuo-hsien, the present terminal station for passengers, and unfortunately work was here again brought to a standstill by the Revolution. Almost a year elapsed before a resumption could be made on even a small section of the work, and it was not till April, 1913, that operations were fully resumed on the balance of the route to Tatung. As many men as available money would permit were employed and railhead is at present in practical sight of Tatung, whilst the roadbed to the river is virtually completed.

Immediately after leaving Kalgan the extension crosses the river over a five span bridge and skirts the hills heading south-west. To the left is an extensive valley under cultivation, which later on merges into other valleys of even wider extent, until the more open country of Shansi is reached.

Heavy rock cuttings, retaining walls and embankments, are a feature of the line for many miles. After the crossing of a fifteen span bridge over the Tan Yang-ho, Chaikowpu station is reached; the old walled city first being seen. Through barren and burnt bridges the route emerges again on the Yang-ho, which it follows a distance of some 35 miles. At the walled city of Yung Chia-pu the first glimpse is obtained of the portion of the Great Wall system which marks the province of Shansi. The wall here is of mud and can be seen threading its sinuous way along the foothills; looking as compact as when first erected, some hundreds of years ago, except in places where the violent mountain torrents have torn their way through.

A few miles from Yung Chia-pu the train runs parallel with the wall and continues so for many miles until that ancient barrier to the Mongols mounts the ridges and disappears in the mountains. A well cultivated valley, which has Tienchen for its principal city and station, is traversed and still on an up grade the line crosses the crests of low hills well above the wide green valley near Yangkuo-hsien. The work in this region is easy cutting or low embankment.

Leaving this station by construction train the line still climbs; this time through a poor country, all cultivated but bearing very poor crops. For per-



THE CHANG-SUI (KALGAN-SUIYUAN) RAILWAY.—This sketch shows the route of the extension from Kalgan to Tatung-fu and the proposed line to Suiyuancheng and Hokou on the Yellow River. The line will not actually touch Suiyuan. The station will be at Kweihua-chang, a market town a little to the south.

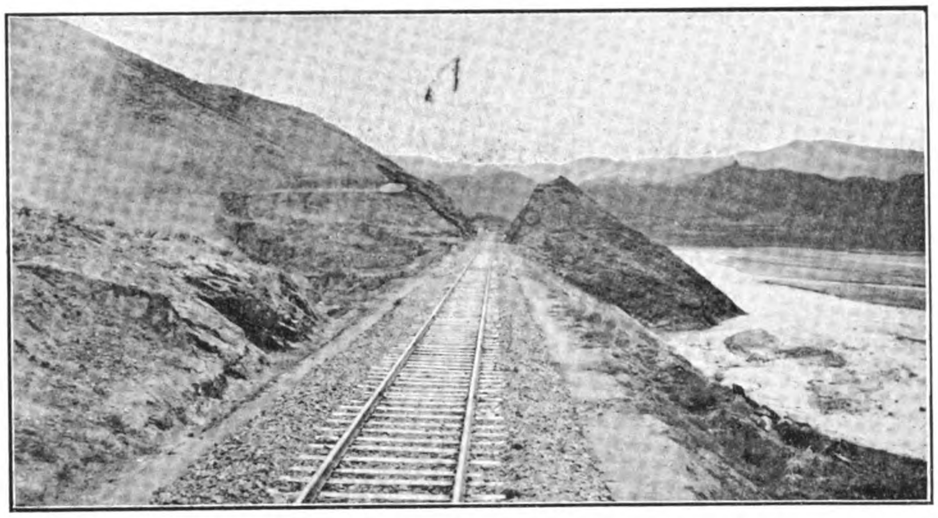
haps twenty or thirty miles the country is boulder strewn. There are no water-courses here. When the heavy storms come the torrents which rush down from the bare mountains simply sweep over the country covering it with gravel and boulders and in the rainy season provide a constant menace to the safety to the line, which has to be carried on an embankment to prevent burial in silt.

The valley which is kept to the left is now broken by a low ridge which the line obliquely crosses, the crest (4,800 ft.) being the highest point on the route. The station here is called Shao Chia-tsao, which is reached through a cutting, and then the descent to Tatung takes place over rolling country and across numerous loess clefts which score this region. These constitute the greatest difficulty, for otherwise the line is easy of construction. One or two deep cuttings through loess and, as the river is neared, through gravel, are necessitated to reduce the height of the bridge which will cross the river Yu to Tatung. Most of these cuttings are now completed, and work has already been commenced upon the bridge foundations.

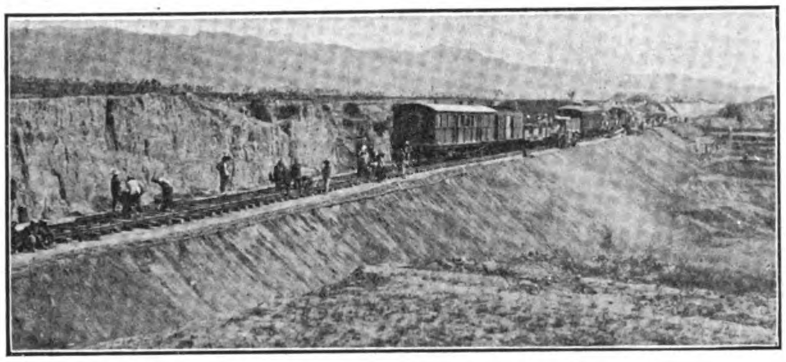
Several pile drivers have been installed on the bed of the river, which contains little water in the dry season, and by the time the rain commenced much work had been completed. Under each pier from 46 to 60 piles will be driven—according to the nature of the ground—Oregon pine piles 33 feet in length being used. Sheathing piles will be driven round these and with the excavation of the gravel the piles will be sawn down to permit of a foundation of ten to twelve feet of concrete being laid to carry the piers.

The bridge will, as stated before, be carried on seventeen concrete piers, and the track will be 52½ feet above the bed of the stream. An accompanying illustration furnishes details of the structure. It is expected the bridge will be completed by the end of spring.

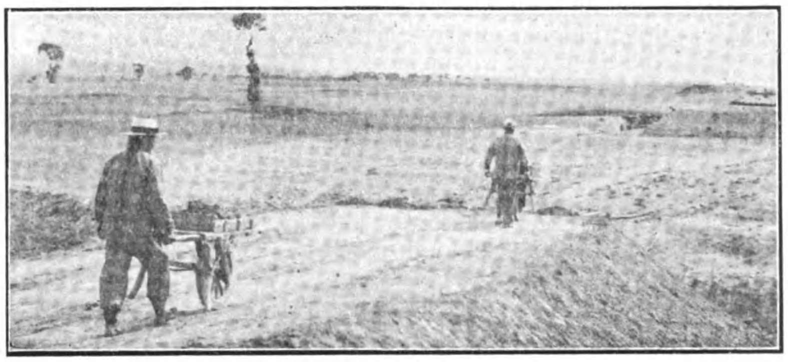
The bridge carries the line to the east of Tatung-fu city, which lies



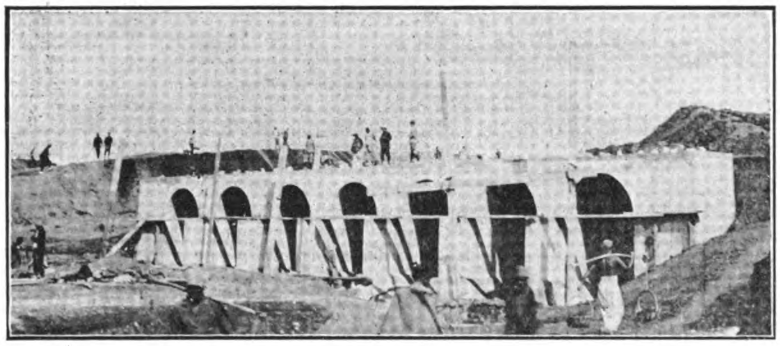
PEKING-TATUNG-FU RAILWAY.—A glimpse of the country along the Tang River



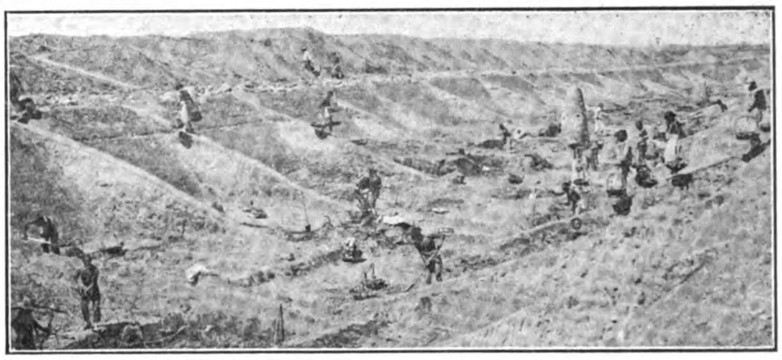
PEKING-TATUNG-FU RAILWAY.—Embankment across a loess chasm at Shao Chia-tsao



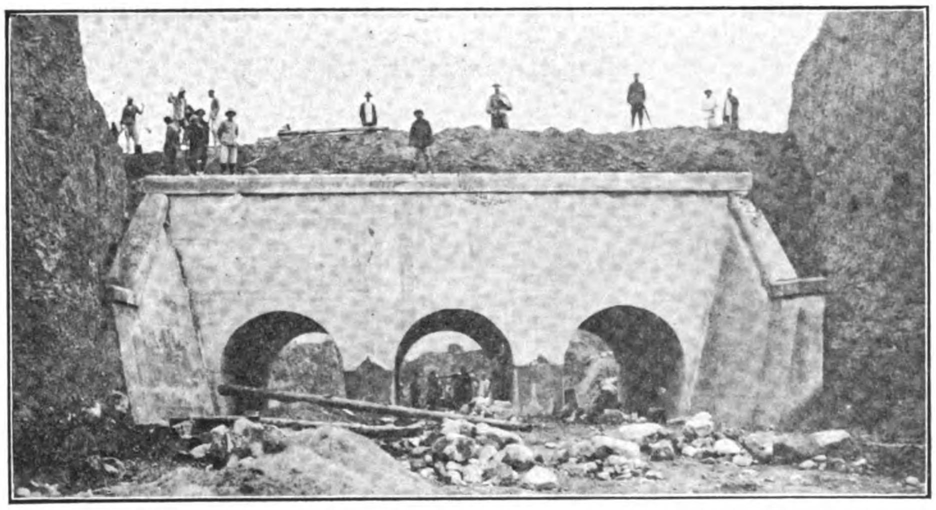
PEKING-TATUNG-FU RAILWAY.—Embankment construction on the rolling country near Tatung-fu



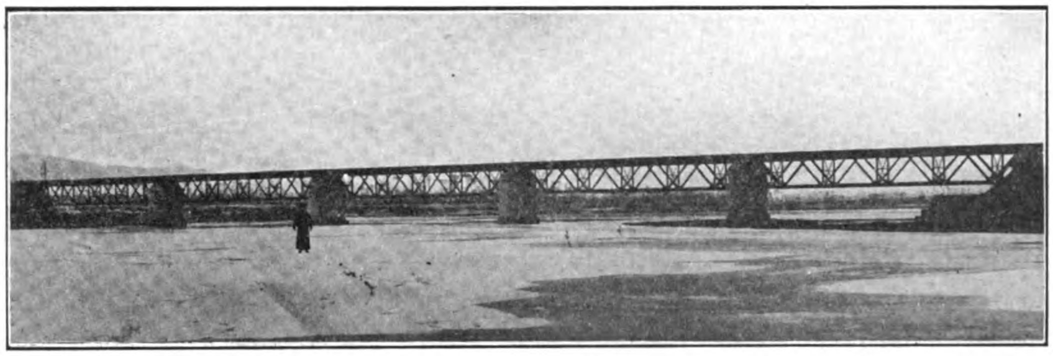
PEKING-TATUNG-FU RAILWAY.—Seven arch concrete culvert at Chu Chia-shao to carry an embankment 55 feet high. The arches are 12 ft. high by 10 ft. wide by 152 ft. long



PEKING-TATUNG-FU RAILWAY.—Excavating a cutting near Tatung-fu



PEKING-TATUNG-FU RAILWAY.—Concrete culvert at Sha Chia-tsao. The arches are 10 ft. high, 10 ft. wide and 38 ft. in length. An embankment 13 ft. high carries the rails across the loess chasm



PEKING-TATUNG-FU RAILWAY.—The bridge over the Sin Yang-ho

a few hundred yards away within its decaying walls. It is the centre of a large cereal raising, coal-bearing region, and is the distributing city for a large trade to Mongolia, via Kweihwacheng and Suiyuan. The station will be established on high land at present under cultivation, but until the bridge is completed the traffic will be handled from the opposite bank of the river. It is fordable at all times of the year except in the flood season, when it rises from a foot up to twenty-five feet and more. The great height of the bridge is not necessitated by the probable flood level, but by the high country through which the line approaches the river.

The line has been surveyed as far as Suiyuan, and the surveyers report that its construction will entail very heavy work in cuttings and tunnelling. So far the Government has decided not to proceed, and unless financial affairs rapidly brighten Tatung-fu will be the terminus for a considerable period.

Even as it is the railway will cause Tatung to increase rapidly in importance. Lignite coal now sells in the city for as low as one dollar per ton, and a branch line to the mines in the hills close to the city should deliver the fuel to the railway at a very low rate.

Tatung-fu will also profit by the fact that it will be the junction with the line projected to connect with Taiyuan-fu.

Mr. K. Y. Kwong, the engineer-in-chief, has a loyal and capable engineering staff. Mr. Chan Si-lin is the assistant engineer-in-chief, while Mr. Cha Chao-lin is in charge of the construction on the second division from Tiencheng to Tatung. He has with him Messrs. Liu Chi, Wei Hsen-wu, and Shao Pao-cheng. Mr. J. F. Yu is in charge of the first division, now open for traffic.

Mr. K. Y. Kwong (Kwong King Yang) is an American educated student, who has proved that the Chinese are able to apply Western learning efficaciously and economically. He is keen on his work and takes a remarkable personal interest in all details. He went to America in 1874 with the first group of Chinese

Mr. Liu Chi,
Resident Maintenance Engineer, Changsui Extension

students, and after a period of private tuition entered the East Hampton (Mass.) Grammar School. Two years later he graduated from Williston Seminary, and entered the Massachusetts Institute of Technology, where he was compelled to discontinue his studies by the recall of the Commission with which he was connected in his studies. Upon returning to China, however, he decided to continue in touch with engineering and entered the employ of the Kaiping Coal Mining Company, resigning three years later to join in the construction of the Peking-Mukden railway. He rose to resident engineer, and when the Peking-Kalgan line was commenced he was made District Engineer of the construction of the Nankou Pass section, the most difficult piece of work in North China. Subsequently he was given control of the Canton end of the Canton-Hankow railway, and by 1911 had placed seventy miles of line in operation. He then returned to the Kalgan line as engineer-in-chief, and it has been the adoption of his advice that has brought that system from a losing to a paying one. At the time of the Revolution he was requested to take up the Director-Generalship of the Changsui Extension as well as the duties of Engineer-in-Chief, but that he declined, and proposed that Mr. M. C. Kuan, the Director-General of the Peking-Kalgan line, should act in both capacities.

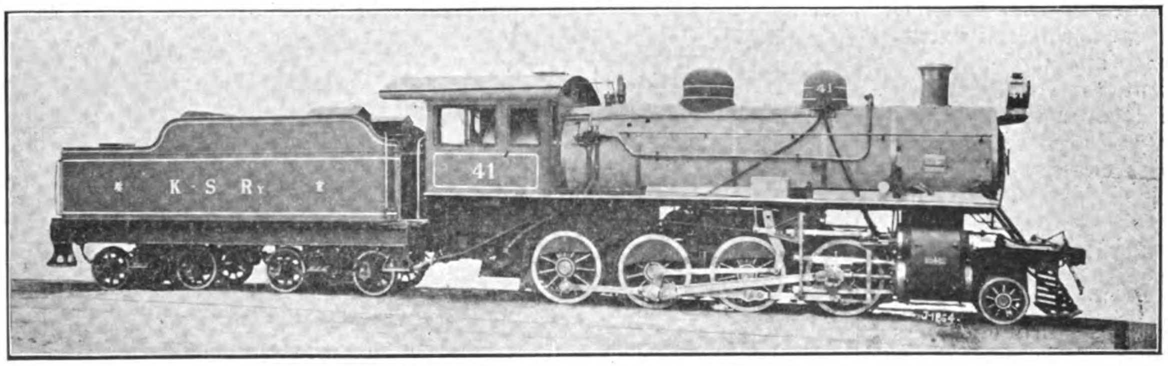
(*Continued on page 88*)

AMERICAN ELECTRICAL SUPPLIES IN JAPAN

The sale of American electrical machinery and supplies in Japan during 1912 was the largest in the history of this line of business in the Empire, reports Consul-General Sammons. The total sales of electrical supplies for the year aggregated over $5,000,000, the bulk of the imported products coming from America. The importation of all kinds of machinery into Japan increased about $1,500,000 during 1912, the total, in round numbers, being $14,150,000.

There are in Japan several British manufacturers who have a fairly large electrical business, but the Allgemeine Co. and the Siemens-Schuckert Co. are the two large German competitors of the American manufacturers of heavy electrical machinery and supplies.

The principal business during 1912 consisted of the extension of existing light, power, and railway stations. The Tokyo Municipal Railway, for instance, purchased $300,000 worth of apparatus for transforming high-tension current in their various sub-stations throughout the city to the trolley voltage.



STANDARD PEKING-KALGAN FREIGHT LOCOMOTIVE.
Designed and constructed by the American Locomotive Company

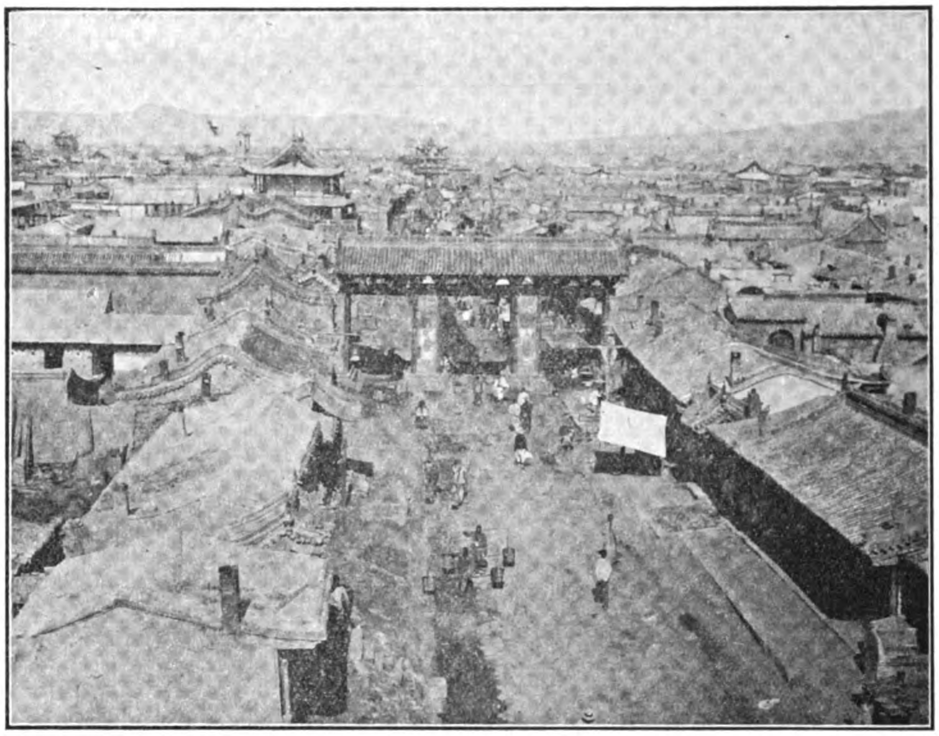
ELECTRIC WATER-POWER PLANT

The machinery ordered about a year ago to Tokyo for various large water power-electric companies has been arriving during the past few months and the plants are being completed. The principal ones are as follow:

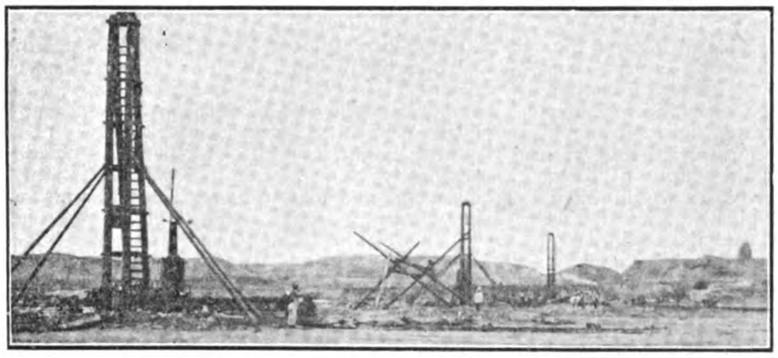
Tokyo Electric Light Co.—An extension of about 40,000 kilowatts to their first water-power electric plant which amounted, when it was installed, to approximately 20,000 kilowatts. This extension is now about finished.

The Kinugawa Hydro-electric Co.—Approximately 40,000 kilowatts. This plant is now about completed and some current is already being generated to Tokyo from its power stations.

Katsuragawa Hydroelectric Power Co.—This equipment complete was supplied from Schenectady, N. Y., the aggregate capacity being about 40,000 kilowatts. All of the machinery has arrived and the work will probably be finished within the next few months, so that a large amount of power from that source will shortly be brought down to Tokyo.



PEKING-TATUNG-FU RAILWAY,—A view in Tatung-fu from the top of the wall



PEKING-TATUNG-FU RAILWAY.—Pile drivers in the bed of the Yu river at Tatung-fu

PEKING-TATUNG-FU RAILWAY.—Concrete culvert at the Hsi Tsoi-tze to carry embankment 63 feet high. The arches are 10 ft., by 10 ft. by 175 ft.

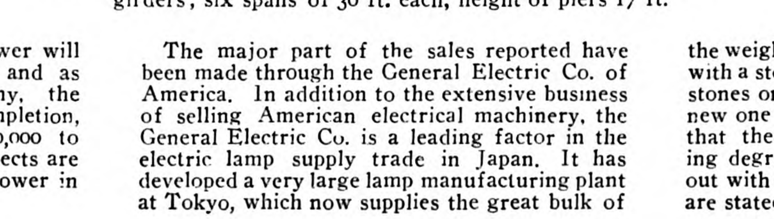
The Inawashiro Hydroelectric Power Co.—The order for this apparatus, amounting to about 40,000 kilowatts, was placed about one-half with an English firm (the Dick Ker Co.) and the other half in America (Westinghouse.) This apparatus has not been shipped yet, and that company will therefore not be ready for operation until after the end of this present year.

At Yokohama a 3,000 kilowatt steam turbine generator was installed further to increase the capacity of the existing lighting plant.

At Osaka there have been many additions to the existing electric railway plants and some small suburban roads have been put into operation in the last four or five months. Osaka is a very active centre for the electrical business in Japan, and many suburban roads have been successfully put into operation there. On account of the large manufacturing interest developed, electric power will be largely used there in the future, and as there is a large water-power company, the Ujigawa, which is now nearing completion, and which will bring into Osaka 30,000 to 40,000 kilowatts of current, the prospects are favorable for low cost light and power in that city in the future.

OTHER BUYERS OF ELECTRICAL MACHINERY

The Kyushiu Electric Railway added during 1912 a 3,000 kilowatt turbo generator set, and at Nagasaki two 500 kilowatt turbo generator sets were installed as an extension to the existing lighting plant. The coal mines in Kyushiu have also been active in purchasing electrical apparatus.



PEKING TATUNG-FU RAILWY.—Bridge at Shang Yu-chien. Steel girders; six spans of 30 ft. each, height of piers 17 ft.

The major part of the sales reported have been made through the General Electric Co. of America. In addition to the extensive business of selling American electrical machinery, the General Electric Co. is a leading factor in the electric lamp supply trade in Japan. It has developed a very large lamp manufacturing plant at Tokyo, which now supplies the great bulk of the incandescent lamps used in the Empire. This plant is operated through a Japanese company under American control. It is managed entirely by Japanese, however, and the operatives are largely Japanese girls. It has been very successful both financially and in supplying the demands of the country. In fact this is a new industry created in Japan within the last three or four years.

The General Electric Co. also owns a considerable interest in the Shibaura Engineering Works at Tokyo, which is controlled by the financially powerful Mitsui Co. The Shibaura works manufacture electrical apparatus up to 2,000 kilowatts, and the business for the past six months was so satisfactory that the company has decided to increase its capital from the present $1,000,000 to $2,000,000 to take care of the demands of the market here. There is close co-öperation between this company and the parent General Electric Co. of Schenectady, N. Y., and there is apparently no reason why this Japanese electrical manufacturing concern should not become very strong and prosperous here. All of its products are manufactured in accordance with the American designs of the General Electric Co.

Large quantities of the smaller electrical supplies are imported into Japan, and in this business American manufacturers and importers participate very satisfactorily. It is evident, however, that the Japanese will be able, particularly through foreign associates, to manufacture the greater part of the smaller electrical supplies, including telephones and telephone equipment. The manufacture of this class of smaller electrical products in Japan is growing steadilyy and rapidly.

ACCORDING to a contemporary a wooden tire has been invented for motor vehicles. It is formed of sections of ash bolted on to the rim in two, three or four rows, according to the weight of the vehicle. Each block is provided with a steel cleat to prevent it from being split by stones on the road. If one block is damaged a new one can be easily substituted. It is claimed that these wooden tires possess an astonishing degree of elasticity. Experiments carried out with them on both light and heavy vehicles are stated to have been highly satisfactory.

MINING ADMINISTRATION IN CHINA

The *Mining Journal* writes:—

The future development of a great mining industry in China is a theme upon which many engineers who have vistited the country have been wont to discant, and with its enormous population and great deposits of coal there seems every reason to expect in due course the growth of a very large home market, and possibly, if capital does not become permanently scarcer, the creation of important industries doing a large export trade. Whether the mineral riches of the country are as great as in their present little known condition they are generally assumed to be or no, there can be no doubt that the anxiety displayed by European capitalists to acquire mining concession has awakened Chinese interest in the country's latent wealth, and is no doubt largely responsible for the hostility with which native opinion of late has come to regard the alienation of mineral concession to foreign concerns. The day, however, has gone by to oppose mere negation to the advancing capitalist, and as the necessity for foreign finance becomes increasingly realised a knowledge of what the country has to offer in the way of unascertained assets is more generally felt. Some tentative efforts have been made to meet the general native ignorance of mining in a modern sense from which China suffers by the formation of the Tongshan school with which the Chinese Engineering andMining Companywas associated, and by the creation of a geological department in the Peking University; but no systematic attempt, so far as we are aware, has been hitherto attempted to create a mining department to study the resources of the country, create a technical administration, and train a body of professional engineers. According to particulars contained in a pamphlet recently issued by the Minister of Industry and Commerce, and to observations explanatory of the circular contained in a recent issue of the *Far Eastern Review*, a more or less complete scheme has been evolved, which is of much interest not only as regards the prospects for China herself, but also as a practical commentary on the various feature of mining administration in different parts of the world, since in a case of this kind there can be no doubt that imitation is the sincerest flattery. It is proposed to create three distinct entities, called the Mining Academy, the Prospecting Corps, and the National Mining Association; while, owing to the fact that China is in the fortunate position of being able to create the foundations of a national mining service unhampered by any pre-existing organisation, these various departments would have an integral connection. The Mining Academy, to treat of these departments in their logical order, will take students who have passed the middle school course and give them a three years' course consisting partly of class and partly of field work. A start is to be made with thirty students, who will select either a mining or geological course. The staff of the Academy is to consist of a president and four professors, two of whom must be foreign. These professors will spend half the year in prospecting work and half in teaching. Graduates from the Academy will receive the title of M.E., and will then be eligible for the second branch of the national organisation—the Prospecting Corps—after three years' work, in which they may be appointed Technical Experts. It will be seen that the object of the scheme is to create in as short a time as possible a large body of trained men who can undertake a geological survey of the vast territories contained in the Chinese Empire. It is proposed to divide the country into three categories: Districts which are rich and easy of exploitation, districts where communications are easy, and districts where communications are poor and mineral prospects unattractive. At the present time it is estimated in the broadest outline that one-tenth of the country answers to the requirements of the first class, three-tenths to those of the second and six-tenths to those of the third. Allowing a period of fifteen years, it is hoped that it may be possible to collect reports and specimens and map the country in greater or less detail on the principles outlined, and thus afford a basis upon which the Government and people of China may be able to embark on mining on an intelligent basis. In addition to the Academy and Prospecting Corps, the third body to be formed, the National Mining Association, is no less important. Its members will be drawn from the proprictors of mining companies and others engaged in mining work, students who obtain their mining degree, and capitalists who are connected with the mineral industry. This Association will act as the adviser to the Government in mining matters, maintain a laboratory, make a comparative study of mining generally, create a publicity department embracing monographs, practical text-books and a periodical mining magazine, and finally establish a sort of appointments' board and a bureau for investigating claims preferred for State assistance by province or districts. Owing to conditions in China, and in consequence, perhaps, of a study of the trend of modern developments in the more advanced mining countries, it is assumed from the first that private capital will be inadequate to deal with the capital requirements of the mining industry, and that much will have to be derived from the Government, which in its turn will have to have recourse to foreign loans. Consequently, the responsibility thrown upon the department responsible for approving or rejecting any claims will be a considerable one, and the necessity of reliable technical advice indispensable. That the teachings of mining history do not go altogether unread in China is somewhat amusingly illustrated by a reference to Australia. Australians, as we are told, are fond of saying that the gold output of their continent in the past fifty years would have sufficed to build a triumphant arch of the precious metal, but the capital required to produce this would furnish two such arches, and the lesson is drawn that if the exploitation of the investor has been so great in a rich country where people are to some extent familiar with the industry, the dangers of exploiting the public in a country like China are greater still.

Among the new departures initiated by the recently organized Republic of China, one of the most commendable is the proposed organization of a bureau for systematic study of the mineral resources of the country, says the *Mining and Scientific Press*, and continues:—One of the most critical problems of the new republic is that of national finance, which is closely bound up with national prosperity, which in turn rests upon the development of natural resources, agricultural and mineral. Much has already been done in unsystematic fashion, and the general features of the geography, geology, and mineral resources of China are fairly well known through the studies of a succession of explorers and students, beginning with Marco Polo and extending down to the present. The most important work was done by Baron F. von Richthofen and the geologists attached to the 'Mission' of the Lyons Chamber of Commerce. The United States bore honorable part in this pioneer work through the explorations of Messrs. R. Pumpelly, Bailey Willis, and others. The need for systematic and continuous study as an aid to right development is obvious, and the new government is to be commended for the promptitude with which it has taken up this matter.

The method of organizing as so far announced, seems less commendable. It is proposed to found, under the Ministry of Industry and Commerce, a Mining Academy to be situated in Peking and to consist of a president and four professors, two of whom are to be foreigners and two Chinese, and it is interesting to note that, following the plan suggested by Mr. T. A. Rickard some years ago, the professors are alternately to teach one-half of the time and to spend the other half in the field. The graduates of the Academy are to be organized into a Prospecting Corps which will study the mineral deposits of the various provinces and map them in order to determine which are most worthy of immediate development. It is apparently taken for granted that government aid will be asked in the development of mineral deposits, and one of the functions of the new bureau will be to pass upon the validity of such requests as well as to prevent the organization of swindles. The conjunction of teaching and geological surveying presents various disadvantages, and is evidently proposed in order to build up a corps which has been trained under the supervision of the heads of the organization. Little is to be gained by such a method, and much is sacrificed. The number of Chinese young men who have already been trained in geological and mining work, chiefly in foreign countries, is ample to furnish the personnel of such an organization, and the training of raw recruits only leads to unnecessary delay in bringing the institution to a stage where it can do effective work. In addition, all previous experience goes to show that educational institutions in Peking are unpleasantly accessible to official interference, to the great detriment of their work. The director of the new bureau is to be Mr. Esous Chang, and the mining professor Mr. C. Y. Liu, a graduate in 1911 of the School of Mines of Columbia University. Both of these gentlemen are guilty of "the crime of being young" and are accordingly lacking in the previous experience which the organization of a survey of a country larger than the United States would seem to demand. On the other hand, it must be remembered that Clarence King was also a very young man when he led the way in similar work in this country, and we hope Messrs. Chang and Liu may meet with a corresponding degree of success. A further proposal, which is excellent, is the organization of a National Mining Association, which is to combine the functions of the Institute of Mining Engineers and the Mining and Metallurgical Society in this country, and is to co-öperate with the Academy and Prospecting Corps. Any work which these organizations are able to do will be for the advantage of the newest of republics, and we wish them Godspeed.

PEKING-KALGAN-TATUNG-FU RAILWAY

List of Important Bridges on Changsui Extension

(*Continued from page 86*)

Tung Chiao Ho bridge, at Kalgan, 5 deck spans of 100 ft.

Ta Yang Ho bridge just East of Tsai Kou Pu Station, 16 deck spans of 100 ft.

Siu Yang Ho bridge, also East of Tsai Kou Pu Station, 7 deck spans of 100 ft.

At Chung Kao Chuang

7-10 ft. arch culvert and embankment filling over top of arch is 62 ft.

At Hsichuitze

Double 10 ft. arch culvert embankment filling over top of arch is 63 ft. high.

At Tatungfu, Yu Ho

17-deck spans of 100 ft. height of pier from river bed is 54 ft.

ANOTHER BELGIAN RAILWAY

FROM SOUTH TO NORTH OF SHANSI PROVINCE

The Chinese Government has signed an agreement with the Belgian concern known as "Compagnie Générale de Chemin de Fer et de Tramways en Chine" for the construction of a railway longitudinally through the province of Shansi.

Such a railway will connect the midland trunk line (the Lung-Tsing-U-Hai), now being built with loan funds supplied by the same Company, with the Peking-Kalgan extension at Tatung-fu.

The junction of this newly projected line with the Lung-Tsing-U-Hai railway will be at Tung-kwan, in the extreme south-west of Shansi. The route will thence run north by east to Taiyuan-fu (the Capital of Shansi province and the present terminus of the railway from Cheng Ting-fu, on the Peking-Hankow trunk line). From Taiyuan-fu it will continue in a northerly direction to Tatung-fu, which, in a few months, will be the railhead of the Chang-sui Extension of the Peking-Kalgan line described elsewhere in this issue.

An important aspect of this agreement is that the Company have the option to extend the railway in the south from Tung-kwan to Chengtu, the capital of Szechuan.

With the extension the line will be some 960 miles in length.

No railway in China are likely to have such an important bearing upon the political future of the country as these two routes which have now come under the dominance of the Belgian financial organisation named in the first paragraph of this article.

Apart from its political bearing, however, the projected railway will place in the hands of the Belgian syndicate the greatest amount of mileage held by any individual nation in China, and the two routes will embrace an area of country of tremendous importance to Russia, whose financiers are alleged to be interested in the Compagnie Générale de Chemins de Fer et de Tramways en China.

Considered from a purely economic standpoint the proposed line is likely to have a tremendous influence upon the development of one of the richest mineral bearing provinces of China. It is set down as a fact that Shansi possesses coal fields more extensive and richer than any other like area of the world, while iron exists in great abundance. From an agricultural point of view the products are confined to a great extent within the valleys of Taiyuan-fu and Kiang-chow, and consist mainly of corn, tobacco, cotton and sometimes rice. The climate is too severe to obtain two harvests per year, so Shansi is compelled to procure from the neighboring plains the products it lacks itself.

The engineers are liable to find the railway one difficult to build—or at least expensive. Shansi is mountainous throughout, a plateau ascending in gradual terraces and intersected by mountain ranges towards the North. It has long monotonous ridges of yellow land and several alluvial plains very rich and fertile. The chief mountain ridge inclines gradually from north to south, forming a plateau which varies in elevation from 2,600 to 5,000 feet, being flanked on the east, north-east, and north by peaks which rise to a still higher altitude. Its steep slopes have been deeply furrowed and eroded, and disclose to the eye at the present day the calcareous and coaly deposits which constitute its base. On the north long chains traverse it from south-west to north-east, and continue the massive crest of the southern Ordos table-land. These attain an elevation of 3,600 feet. Running along the left bank of the Fen-ho in the south is the Ho-shan range, which rises to a height of 7,860 feet.

In the centre of the province there exists a series of depressions inclining in the direction of north to south and separated from each other. These are the dried up beds of former lakes, which have disappeared, leaving behind a thick alluvial sediment more fertile than the surrounding loess or yellow land. There are seven of these "lakes," and upon their principal sites stand the cities of Tatung-fu (3,900 feet high), Taiyuan-fu (2,600 feet high), and Ping Yang-fu (1,800 feet high). The southernmost, that of Hsiai Chow, attains an elevation of only 1,200 feet.

For a considerable distance on its progress northward the proposed railway will undoubtedly follow the valley of the Fen river. This is the largest stream in Shansi. It rises north of Taiyuan-fu and enters the Yellow River in the south of the province after watering the most fertile part of Shansi. It crosses the two richest plains of Shansi, those of Taiyuan-fu and of Ping Yang-fu. Its waters frequently rise suddenly and devastate the adjoining region.

From Taiyuan-fu to Kiang-chow a very frequented road, traversing numerous important cities, runs along its banks. It is navigable for no great distance, boats being able to go no further into the province than Kiang-chow.

The chief cities likely to be tapped by the railway, are, in the order of their location proceeding northwards from Tung-kwan, Kiang-chow, Ping Yang-fu, Fenchow, Taiyuan-fu, Ning Wu-fu, Tatung-fu and Kwei Hwa-cheng.

Kiang-chow is within the bend of the Fen-ho, and is prettily situated. It is the terminus of navigation and the principal market place of south Shansi. It lies in a plain of considerable fertility and is in the neighborhood of coal mines.

Ping Yang-fu is one of the oldest cities of China, but of its ancient splendor the only remnant to-day is a magnificent city wall. It is situated in a vast alluvial plain where the system of irrigation is unrivalled. Tradition states that the Emperor Yao once resided there.

Fenchow-fu is an important town near a rich valley abounding in coal.

Taiyuan-fu is, of course, the capital of the province, and by virtue of this fact and its railway connection, is the most important city in the province. It is situated on an elevation of 2,600 feet on the north of a vast plain studded with populous villages and neatly constructed houses. Nearly all the valleys which open on to the plains have mines, carts drawn by oxen, wheelbarrows, and pack animals bringing the coal to the capital. Formerly this city manufactured defensive weapons on an extensive scale. Its commerce is very brisk. It is surrounded by beautiful gardens and orchards. In several places throughout the plain coal, iron, and sulphur are found. The city is electrically lighted, and its roadways are macadamised and well kept.

Tatung-fu has already been referred to in the article dealing with the Chang-sui Extension. It is destined to be an important trading centre, and the deposits of coal and sodium carbonate in the vicinity are sure to become of great value.

Kwei Hwa-cheng, or the Blue City, comprises two towns, the one religious and military, with its schools and its Lama monastery (the Grand Lama of Urga at one time resided here); the other largely commercial. The latter is an important market for skins and camel-hair ropes, etc., imported from Mongolia. The environs are covered with fruit trees.

The exports of Shansi are principally coal, iron, salt and products from Mongolia, while the imports consist of corn, silk, woollen goods, tea and salted provisions.

In both industry and commerce Shansi holds a prominent place, many cities and villages devoting themselves to industry. It is this fact combined with the undoubted richness of the province which tend to make the proposed railway one of considerable value as an earning factor.

CHINESE PAVILION AT BRUSSELS

The Consul-General for Belgium, Mr. D. Siffert, sends us the following:—

The Chinese Pavilion, situated near the Garden of His Majesty the King of the Belgians, Brussels, has just been annexed to the Official Bureau of Commercial Informations, and will be devoted to a permanent exhibition of articles which may form the object of a traffic between Belgium and China.

The utility for Chinese Firms to exhibit their products in the Chinese Pavilion is evident, and hereunder are the conditions to which exhibitors should comply to benefit of His Majesty's Government offer.

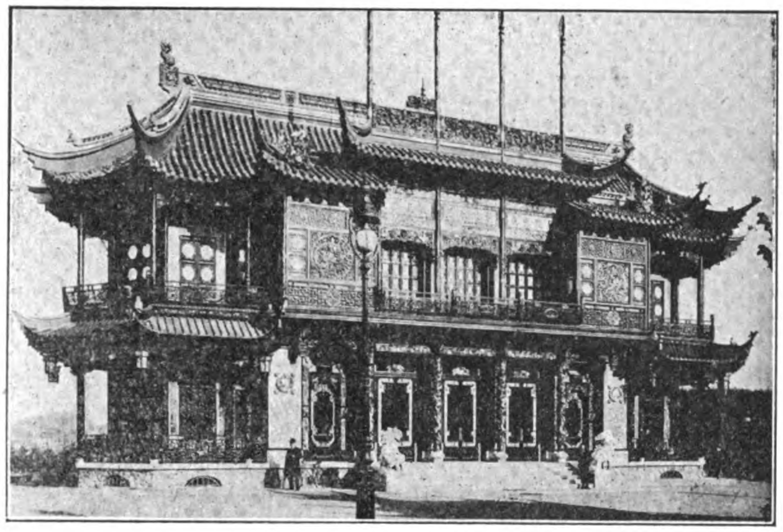
1°. No fee shall be levelled for rent and supervision. Collections will be kept in the Chinese Pavilion, Government's Building, under the supervision of the Foreign Office staff and every care will be taken against theft or fire. However as no tax is collected, the Government shall not be held responsible for loss, wreck or theft of the objects; those risks being taken by the owners in consequence of the service rendered.

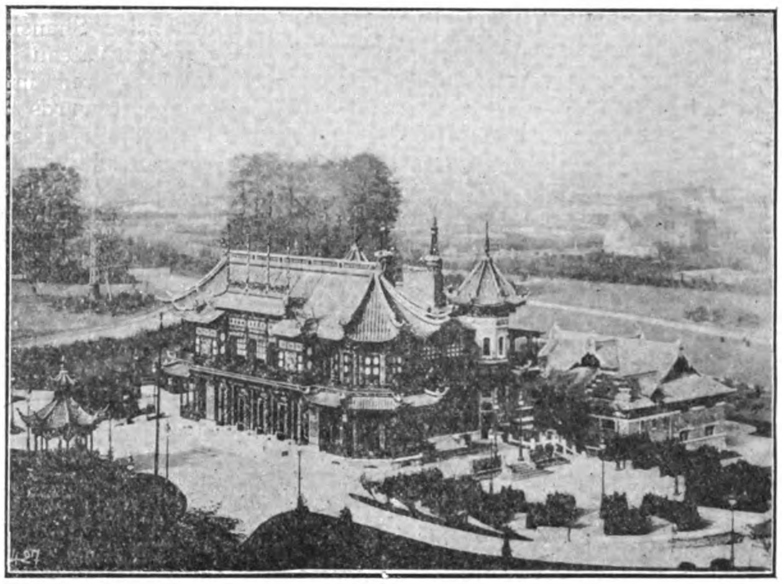
2°. Cases or Boxes containing Collections must be provided with an address stamped with the seal of the Belgian Consulate according to a model at hand.

3°. No Customs duties shall have to be paid.

4°. Collections exhibited are not for sale. All informations regarding origin, prices and freight, rates must be added, and the staff of the building will give to those interested in Belgium the necessary information to persons desirous to get into touch with exhibitors for buying purposes, or with a view to represent them in Belgium.

5°. Forwarding charges c.i.f. Antwerp are to be paid by owners. The Government will, however, assume the cost of reception of articles which exhibitors should want to replace or take back. Said forwarding charges shall be paid by the Government for exhibits presented to them by exhibitors and becoming thus their property.





The opening of the Exhibition taking place in the course of August, 1915, exhibitors are respectfully requested to communicate without delay with the Belgian Consulate-General in Shanghai for further information.

NEW SHANGHAI-DAIREN LINER

Passengers who prefer the overland route between the Far East and Europe, via Siberia, to the ocean route, via Suez, will be glad that, thanks to the well-known go-ahead spirit and enterprise of the South Manchuria Railway Company, they will now be able to travel between Shanghai and Dairen in a fine new steamer specially built for that Company's Shanghai-Dairen Direct Mail Steamer Service. The new steamer, named the Sakaki Maru, was built at Kobe by the Kawasaki Dockyard Company, and was launched on March 23rd of this year. She started her regular service on Thursday, August 14th and arrived at Shanghai on the 16th. By invitation a number of Shanghai residents inspected the fine new steamer. The Sakaki Maru will leave Shanghai every Monday and Dairen every Thursday, thus affording homeward passengers booked for the Wagon Lits the advantage of her accommodation. The new steamer is equipped with the wireless telegraph, and carries a doctor on board. She has a gross tonnage of 3,876 tons, is fitted with the Curtis Turbine Engine, and can develop a speed of over 19 knots per hour. She has accommodation for 63 first-class, 20 second-class, and 164 third-class passengers. The first-class accommodation comprises 15 ordinary cabins, containing 30 berths and 13 sofas; 3 family rooms, containing 12 berths and 3 sofas; and four special rooms containing 5 beds and one sofa. The second-class accommodation consists of four ordinary cabins, containing 16 berths and four sofas; and the third-class comprises 164 bunks. Her length is 366 feet; breadth 45 feet; and depth, 26 feet.

In connection with this development of the Shanghai-Dairen service, it is interesting to learn that the South Manchuria Railway Company will shortly attach Second-Class Sleeping Cars to all its Express Trains. Hitherto, travellers between the Far East and Europe by the Trans-Siberian route have had to travel first-class over the S. M. R. Co.'s section, and this new feature will render what is admitted to be one of the best railway services in the world even more popular.

Both steamer and train times of the South Manchuria Railway Company remain unaltered.

JAPAN COTTON TRADING CO., LTD.

The Japan Cotton Trading Co., Ltd., (Nippon Nenkwa Kabushiki Kaisha) has recently issued a little pamphlet in commemoration of the twentieth anniversary of its establishment.

The progress of the company has been rapid, for, from being solely a commission organization dealing in cotton and cotton yarn, it now engages in cotton ginning and spinning, the manufacture of oil and oil cake from cotton seed, and other important commercial operations.

The company has its head office in Osaka, branches in Shanghai, Hankow, and Bombay, agencies at New York, Fort Worth, Hongkong, Tientsin, Tsingtao, and Dalny, and the following factories:—Sesshin cotton spinning company at Shanghai, beancake factories at Hanyang and Hankow, cotton-seedcake factory at Hankow, and a cotton pressing factory at Hanyang.

At December 31st, 1912, the subscribed capital of the company was Y. 2,000,000, with reserve funds of Y. 900,000. The net profit for the last half-year amounted to Y. 322,492.

On account of the expansion of business in Shanghai, a new office site has been purchased at the corner of Hankow and Szechuen roads, for which the sum of Tls. 180,000 was paid.

At the general meeting of shareholders held on July 21st last at Osaka, Mr. Y. O. Baba, manager of the company's Shanghai branch, was elected a director to reside in Shanghai, retaining, at the same time, the management of the office as heretofore.

Mr. Atsushi Yamada, another director, is the first and only Japanese member to hold a seat on the New York Cotton Exchange.

ADVERTISEMENT CORRECTION

Certain corrections for the advertisement of Messrs. Arnhold, Karberg & Co, which appears on page 23, were received too late to be made in the advertisement itself. Among the agencies held by Messrs. Arnhold, Karberg & Co, the following changes are to be noted:—For Ammunition, etc., instead of Deutsche Waffen and Munitions Fabriken, Berlin, Karlsruhe, the firm represents Hirtenberger Petronen-Zundhutchenend Metallwaren Fabrik Hirtenberg; for Army Rifles, Arms, etc., instead of Waffenfabrik Mauser A. G., Obendorf, Nickar, the firm represents Osterreichische Waffenfabrik Ges: Steyr, while the agency for the Falls Hollow Stay Bolt Company, Cuyahoga Falls, Ohio, for Boiler Stay Bolt Material has been relinquished.

THE FAR EASTERN REVIEW

COMMERCE :-: ENGINEERING :-: FINANCE

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SHANGHAI,
CHINA

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THE MONTH IN CHINA

Although there were indications at the end of July that the rebellion was likely to prove entirely unsuccessful, the rebels continued a stubborn resistance throughout August. Inevitably as a result the strife continued practically to monopolize attention and the revival of trade and commerce which was hoped for, if not anticipated, was again postponed to the indefinite future. Whatever happens in the next few weeks, the progress of China towards better economic conditions has been seriously retarded. Even before the rebellion broke out China was confronted by a serious financial position. The relief afforded by the Five Power Loan, it was realized, was temporary in character and the problem of securing even sufficient money for administrative purposes during the last quarter of the year was already demanding attention. It is hardly necessary to say that the problem has now become much more difficult of solution. Ever since the revolution in 1911 the taxation machinery has been idle or has been working irregularly—the Customs excepted.

Under the conditions which prevailed and have now been intensified, it was impossible to reorganize and systematize the scheme of provincial taxation. If the Central Government are to perform their functions at all satisfactorily, it is essential that they should have definite knowledge of what revenue they can expect to receive. Ever since the revolution, and especially at the present time, the Government are completely in the dark in regard to this and other material points. A readjustment of the political relations between the Central Government and the Provincial Governments is clearly necessary, and it is to be anticipated that one result of the rebellion will be a clearer delimitation of their respective powers. This will, however, take time and in the meantime temporary means will have to be adopted to pay the expenses of administration and provide for the service of foreign loans.

In the meantime the work of reorganization and development is held up. For China to attain a position of national solvency the old industrial machinery will largely have to be scrapped. The struggle for industrial supremacy is so strenuous at the present day that the adoption of the most modern methods and the latest appliances is essential to success. Unfortunately for China these requisites cost money. The position is an extremely difficult one. Unless China adopts modern methods and appliances she cannot secure the revenue upon which her national safety depends; unless she secures money she cannot adopt modern methods and appliances. It is obvious that the problem is one that calls for constructive statesmanship of a very high order. Upon its satisfactory solution may depend the continued existence of China as a separate national entity.

At the present time it is impossible definitely to state the effect that the rebellion has had upon the railways. A useful indication, however, is given by the figures relating to the Shanghai-Nanking Railway, which we publish elsewhere. In addition to the direct loss due to curtailed earnings account must be taken of the damage to the permanent way, buildings and bridges and rolling stock. Fortunately the Hwai River Bridge on the Tientsin-Pukow line escaped destruction, though it would appear that it was in imminent danger. The aggregate loss to the Peking-Hankow, Tientsin-Pukow and Shanghai-Nanking railways must total a very large figure. Another object lesson in the value of railways in time of war has, however, been given, and if the result be increased activity in railway construction a certain amount of good will have come out of an undoubted evil.

Numerous rumours of fresh loans for railway and other purposes were in circulation during the month. The agreement for the construction of the Canton-Chungking Railway signed by the Chinese National Railway Corporation and Messrs. Pauling & Co., Ltd., has not apparently been finally sanctioned. It is stated, however, that a contract for a loan of £10,000,000 has been signed between the Government and the Compagnie Générale de Chemins de Fer et de Tramways en Chine for the construction of a line from Kwei Hwa-cheng to Cheng-tu. Messrs. Carlowitz & Co. are said to have offered the Provincial Government of Yunnan £3,000,000 for the construction of a line from Yunnanfu to Poseh in return for certain concessions. A number of other offers of financial assistance, it is reported, have been made to the Central and Provincial Governments.

The Chinese Parliament, it is interesting to note, has continued its sittings during the month and has made steady progress. The Kuomintang, or Nationalist Party, has expelled from its ranks the prominent members who had openly joined the rebellion.

U. S. RAILWAY BUSINESS FOR MAY

During May the railways of the United States received for their services to the public an average of $8,230,000 a day; it cost to run their trains and for other expenses of operation $5,920,000 a day; their taxes were $341,500 a day; their operating income $1,972,322 a day for the 220,897 miles of line reporting, or at the rate of $8.93 for each mile of line for each day. Thus for every six dollars of their earnings which remained available for rentals, interest on bonds, appropriations for betterments, improvements and new construction, and for dividends, the railways had to pay more than one dollar in taxes.

(Continued on page 93)

GROWTH OF BELGIAN INTERESTS IN CHINA

As is announced in another part of this issue China has signed an agreement for a loan with Belgian financiers to construct and equip a railway through Shansi province, with an extension southwards to Chengtu—the capital of Szechuan province.

The signature of this agreement brings forcibly to notice the most important development in international enterprise which has taken place in China in recent times. Belgian interests have sprung up in a night, as it were, with the rapidity of the famous beanstalk of fable. From a comparatively insignificent seed they have sprouted into luxurious vegetation which casts compassionate shadows upon the meagre crop produced by other less wide-awake foreign financial farmers who have been tilling the not too productive soil of China for many decades.

Whether this forced growth of an exotic is good for China is another question. The fact that has to be faced is that it is here, and thriving amazingly. Results count. The Belgians who have been working quietly and unostentatiously to produce the wherewithal for the beanfeast are to be congratulated; nor need too close an inquiry be instituted in regard to the method of fertilisation adopted to produce so fruitful a crop, whilst laborers in other directions have evoked nothing much more exhilarating to the feelings than an ænemic looking sprout which has nothing to recommend it to consideration but the questionable verdancy of "promise."

The feeble little plant of the Quintuple Group, for instance, has been watered mainly with the saliferous lachrymation of disappointed hopes. The Group floated a Reorganisation Loan of £25,000,000—an unproductive piece of business—to aid China through her troubles, and China shows her gratitude for the assistance in that time of pressing need by granting financiers outside the sacred pale of the Quintuple consortium substantial railway loan agreements which make past performances of the kind look insignificant in comparison.

In the short time which has elapsed since the Revolution Belgian interests have been particularly favored. They have been granted the now notorious loan contracted for the Government by Mr. Tang Shao-yi, for £1,000,000; the loan for the construction of the Lung-Tsing-U-Hai railway for £10,000,000, and the loan just signed for the construction of the railway through Shansi province. The chief item of importance in the last two transactions is the fact that the Belgians have the monopoly to supply the whole equipment for some two thousand miles of railway.

The Governments behind the Quintuple Group have religiously prevented their nationals from participating in business which has undoubtedly been available, in order to keep China in the narrow path of financial rectitude, and that fact combined with the reluctance of the Chinese to be fettered too much at this period with exacting schemes for auditing, has made it possible for the Belgian operators to effect one of the largest coups that have been brought off by one combination in many years. A consideration which may have induced the Chinese Government to make these railway deals is a sense of gratitude to the Belgians for coming forward in March, 1912, with a welcome million sterling which aided them materially in defraying expenditure in certain directions which the then Sextuple Group would not have tolerated. A further inducement undoubtedly was the possibility of securing further sorely needed ready money in the shape of "advances" which could be used without the aggravating interference of auditors.

The representatives of the Compagnie Générale de Chemins de fer et de Tramways en Chine have been up and doing whilst the Quintuple Group and the representatives of the Governments supporting them have been resting in placid contentment on the salubrious Western Hills, near Peking, or have been gaily abandoning themselves to the buffeting of the breakers at Pehtaiho, satisfied that they, and they alone could, when they felt so inclined, control such ventures as those which have now slipped past them into the hands of a syndicate hitherto held by them in something akin to contempt. If the Quintuple Group believed that they had the Chinese bound down to a certain procedure with regard to industrial enterprises it would appear, then, that the Chinese have once again exhibited their faculty for being able to drive horses and carts—or, in this case, railway lines—through any undertakings or understandings which they might make. The signing of the agreement for the Lung-Tsing-U-Hai railway was a severe shock to the bankers, but the latest evidence of their failure to control the Chinese Government in the manner in which they believed they would be able to do has come upon them like a bolt from the blue. It is unnecessary to remark that both these agreements were negotiated and signed up in absolute secrecy.

It is quite probable that the Quintuple Governments—or rather one or two of them who need not be specialised—will begin seriously to wonder if after all it was profitable for them so loyally to prevent their nationals doing business of the character now prompting this reference in order to permit such to be controlled by the banking firms represented in the Group. America, of course, withdrew from the Group, and her nationals had a fair field if they had felt disposed to avail themselver of it, but American financiers have no wish to enter into business with China at this juncture, and therefore suffer nothing but the results of inaction of their own volition. But the British independent firms have found themselves seriously handicapped. They have been restrained from activities which might have been productive of excellent results, and even those who have entered into negotiations with China are threatened with lack of diplomatic support in any undertakings into which they may have ventured. It is only natural that independent firms view with anything but gratification the success of the Belgians, but the Belgians are not to be blamed for successfully hauling plums out of the pie in the pantry whilst others have been sucking their thumbs on the lawn. The Belgians are here for business, and they are entitled to what they can secure if the Chinese Government exhibits a disposition to deal lavishly with them.

How such contracts as those entered into with the Belgians will affect China politically in the future is another matter. Much depends upon the amount of Russian money and diplomatic influence involved in the Compagnie Générale de Chemins de fer et de Tramways en Chine—or, to put it in another way, how far the Campagnie is involved in Russian diplomacy. Current report has it that the concern employs its energies in the interest of Russia, but current report is sometimes grievously in error. The allegation, too, is as stoutly denied by the Belgian partisans, while added refutation is supplied by the Russian Minister in Peking, who unequivocally asseverates that Russia has nothing whatever to do with the concern or its affairs.

That may or may not be true. The significant point is that the latest performances of this Company bring into effect the identical scheme which the Russians long ago cherished to obtain railway domination in certain spheres in China. Such a suggestive thing may be merely the long limb of coincidence, but it is worthy of attention.

Reference to old maps, or in fact the map published as late as 1911 under the title of "Stanford's Map of the Empires of China and Japan," will show what that scheme was. Red lines there indicate the Russian project to connect Russia through the centre of China with a warm seaport in the region of the mouth of the old Yellow River or the

Yangtsze River, as well as another line branching northwards from the vicinity of Tungkwan, in south-western Shansi, through Taiyuan-fu, Tatung-fu and Kwei Hwa-cheng, and on to Urga.

The two lines secured by the Belgian Company most peculiarly follow in detail these routes, so far as they concern China proper. From the west Russia designed to enter China by way of the Province of Sinkiang—or what used to be known as Chinese Turkestan—continuing the trans-Caspian system of Russia from its terminal at a place called Andijan, about one hundred miles from the Sinkiang frontier. From there it was planned to build a line south-eastwards to the frontier, and then due eastward to Kashgar, whence it would strike north-eastwards, along the old trading route, through Utch, Aksu, Mai, Sairam, Karashar and Hami. It would then turn south-eastwards across the boundary of Kansu Province, through Suchow (to which place the Belgians now have the option to extend the midland trunk system), to Lanchow-fu, on to Sian-fu, to Honan, Kaifeng, and to the sea. As far as Suchow, in Kansu, from the sea this line is now in the control of the Belgian syndicate.

The other Russian project, which linked up with this proposition, was the line already mentioned from Tungkwan longitudinally through Shansi, to the Mongolian frontier, and thence on to Urga. This is the route which has now been obtained by the Belgians as far as Tatung-fu.

Russia, in the latter years of the Manchu régime, used every possible influence to secure the rights for these lines, but the Manchus—corrupt, short-sighted and disregardful of the welfare of China as they might have been, and as they were alleged to have been—never once lost sight of the dangers that lurked in such a proposition, and they successfully resisted every move made and every blandishment offered to seduce them to forget what they believed to be the best interests of their country. They declined to employ European money in this direction at any cost.

So scrupulous were they, indeed, to avoid complications which might give the claws of the Bear even an indirect hold upon the carcase of their country that they would never, under any circumstances, hypothecate the Peking-Kalgan lines as security for any loan floated by European financiers. Not even the terrible temptation caused by the dire lack of funds which threatened their tottering throne during the Revolution caused them to weaken in this resolve. They could have had money on the security of the Peking-Kalgan Railway which might well have turned the scale in their favor, but they forewent it—and they fell. Yet what did we see? We saw the Premier of this Young Republic, —which, it was claimed, would tread under foot the corruption and the neglect of country which characterized the Manchus,—pledge that line as security for a million sterling from the Belgians almost within one month of the abdication of the alleged "rapacious enemies of China."

Thus the Republicans broke down without a moment's hesitation what was a tradition with the Manchus. Nor was that enough. Within one and a half years of the abdication of the Manchus, the Government has given to European financiers who are alleged, rightly or wrongly, to be influenced by Russian interests, the very railways which Russia strove vainly to obtain from the Manchus. A statement also gained considerable currency in Peking to the effect that the Government had ceded the right of constructing the Tatung-Kwei Hwa-cheng section of the Changsui Extension of the Kalgan line to the Belgians, but that is denied both by the Belgian representatives and the representatives of the Chinese Government. It is difficult to believe that the Government would be so short-sighted as to hand over to continental financiers this vital section of a line which must be portion of any railway destined to connect Urga with Peking, and we are at present prepared to accept their denial of the story, *malgré* the vociferations of its circulators as to its accuracy. It is to be hoped in the best interests of China that the Kalgan-Kwei Hwa-cheng railway will always be retained in the control of the Government. It would be folly, to use the mildest phrase, for them to permit any European financiers to build it.

That fears are expressed by well-wishers of China that Russian capital and diplomacy are connected with the Compagnie Générale de Chemins de Fer et de Tramways en China is not suprising in view of the early association of Belgian and Russian interests in China. When the Belgians first came into the field as factors to be reckoned with—that was in 1897 when they secured a contract for a loan of 112,500,000 francs for the construction of the Peking-Hankow railway (760 miles)—they were then described as "a Franco-Belgian combination with Russian proclivities." The financial arrangements during the currency of that loan were by clause eighteen of the contract, placed in charge of the Russo-Asiatic Bank, and the negotiations were strongly supported by the Russian, as well as the French, Government.

Russian interests were not so prominent in the next venture—the contract for the Kaifeng-Honan railway (140 miles) which was signed in November of 1903 The syndicate was then composed of:

La Compagnie Générale de Railways a voie etroite; la Société Générale de Chemins de Fer Economiques; la Compagnie Belge des Chemins de Fer Reunis; la Société Russo-Francaise de Chemins de de Fer et de Tramways; les Banques Empain de Bauer, Anspach, Dausette et Roy de Blicquy; la Banque Russo-Chinese, la Banque Benard et Jarislowsky, etc.

This organisation was known as the Compagnie Générale de Chemins de Fer et de Tramways en Chine, and by virtue of the clause in their contract giving the option of extending the line from Honan-fu to Sian-fu, the recent contract was given to build the Lung-Tsing-U-Hai railway. It is claimed, however, that the organisation underwent a change which eliminated Russian interests, but that remains to be seen. At all events it is certain that French interests exist, and it is more than likely that they will participate in the loan now being arranged for the Shansi project to a large extent. The one thing that is certain is that the loan will not be purely Belgian, and the interesting point to China is: How far does Russia financially or politically participate?

U. S. RAILWAY BUSINESS FOR MAY

(*Continued from page 91*)

All of these amounts are substantially greater than the similar return for May, 1912. They are from the summary of the earnings and expenses compiled by the Bureau of Railway Economics from the monthly reports of the steam railways of the United States to the Interstate Commerce Commission. They include over 95 per cent. of the mileage and earnings of all of the railways of the country.

ELECTRICAL ENTERPRISE IN KOREA

The total amount of capital invested in electrical concerns in Korea is about £1,225,000, says the *Financier*. Of this sum £980,000 is invested in concerns already working, and the balance in electrical works which are in course of construction.

During the year two new companies, the Gensan Hydro-electric Company and the Taikyu Electric Company, commenced operations. The former supplies the town of Gensan with light and power, and is the only hydro-electric company in the country. The latter supplies light and power to the town of Taikyu.

Eight other companies, which have already received official sanction, are expected to commence work during the present year.

For the moment there would seem to be a general tendency to await the results of the undertakings now in hand before embarking upon new enterprises. Though British electrical machinery is perhaps not so largely represented in Korea as could be wished, nevertheless a considerable portion, especially prime movers and boilers, are of British manufacture. British machinery is popular, as it is known to be of good quality, but reasons of economy lead purchasers to seek cheaper markets elsewhere.

It is reported that, with regard to the opening of Pukow, the Director, Mr. Chian, has submitted an estimate of about $10,000,000, which amount, however, does not include the expense for the purchase of lands. The Ministry of Finance cannot raise such a large amount and proposes that a public loan of $20,000,000 should be raised for the opening of this new treaty port.

TIENTSIN-PUKOW LINE, NORTHERN SECTION

ANNUAL REPORT AND ACCOUNTS

General Report

Mr. Hsiau, the Managing Director of the Tientsin-Pukow Line, Northern Section, has issued his report for 1912. He says:—

I herewith submit the report upon the construction and traffic of the Railway during 1912, with the following remarks:

1. Construction.—The progress of the construction during 1912 is dealt with in the attached report of the Engineer-in-Chief.

The Board of Posts and Communications in Peking decided to adopt the thirty-first day of March, 1913, as the date of the termination in the construction in terms of the Tientsin-Pukow Loan Agreement.

2. Loan Service.—During the year under review, it was found impossible to place, at anything like acceptable terms, the second issue of the Supplementary Tientsin-Pukow Loan of 1910, nominally amounting to £1,410,000. This retardation arose out of the political situation in China as well as in Europe and out of the resulting disinclination of the money market to take up any loans. We were therefore compelled to accept the assistance of the Deutsch-Asiatische Bank, who placed at our disposal various sums on the guarantee of the unissued part of the loan, which sums amounted to a total of £662,000 at the end of 1912. During the period September to and including December, 1912, we were in a position, however, to set aside from our traffic revenue sufficient funds to cover our construction and running expenses in China, the part-payments due to the Maschinenfabrik Augsburg-Nürnberg for bridge work and the purchase of material and stores in Europe.

3. Statement of Accounts.—With regard to the appended statement of accounts, the Auditor of the Syndicate has taken occasion to make the following two observations:

A. Final Head Title I: the amounts paid for landpurchase by the Land Office and the Land Office Tsinanfu have not been verified so far by the Engineeer-in-Chief.

B. Store Account Tsinanfu: the amount placed at the debit of this account does not give the final statement end of December, the final accounts having been retarded by stress of work, a final stock taking has been made middle of April (i.e. 1913).

In explanation of these observations, I have to say the following:

a. Purchase of Land.

The purchase of all the ground required was effected by a special Land Purchase Office. This office acquired all the land strictly in accordance with the plans submitted for this purpose by the European divisional engineers. During construction time, this office was working under continuous high pressure and was, in consequence, unable, as will easily be understood, to complete a final detailed survey of all the ground purchased as well as its demarkation by boundary stones. This work was commenced in conjunction with the European engineers at the end of the year, however, and will produce in due time final records of all the purchases of land signed by the engineer and verified by the Engineer-in-Chief.

b. Store Account Tsinanfu.

Towards the end of the construction period in November-December, 1912, all divisions and sections were instructed to return to the Head Store all the material, etc., still in their possession, such as permanent road material, tools, construction plant, etc. It need scarcely be said that with such a vast undertaking as the construction of the Tientsin-Pukow Railway undoubtedly is, these instructions brought forth a very considerable quantity of material, etc., which on being returned to the Head Store, had to be sorted, stored away and revalued as it had more or less suffered from wear and tear. Owing to this increase of work, the staff was unable to finish the inventory of the whole of the stocks by December 31st, 1912. This has been completed in the meantime, however, and the inventory will be embodied in full detail in the final report on the construction period separately showing new and used stocks.

4. Traffic.—A statement of the monthly traffic returns is appended. Detailed statistical records of the various sources of our traffic revenue were not kept in 1912, as during this period the railway was still in the construction stage.

a. Passengers.

Passenger traffic shows a satisfactory upward tendency in all classes. After the junction of the Northern and Southern Section was effected in the last month of the year 1912 by the completion of the Hwangho Bridge, an increase of traffic was noticed, for part of which the additional express train with sleeping accommodation is responsible, which was now started running twice a week both ways between Tientsin and Pukow (Nanking), covering the distance in twenty-six hours, thus offering the quickest mode of travelling between the north with its approaches from Europe via Siberia and the Eastern part of the Yangtze valley with its approaches to America and Australia via Japan and the Philippines. But also the other trains showed increasing revenue from passenger traffic

On May 1st, 1913, daily through passenger trains over the whole line will be introduced, which we confidently expect to give a further impetus to the satisfactory development of our passenger traffic during the first year of traffic operations unimpeded by construction.

b. Goods.

The increase of traffic under this head is still more pronounced. Especially in the South of Shantung, the demand on the traffic facilities of the railway for the transportation of farming products, coal, etc., during the autumn season was such as fully to engage the whole of our rolling stock.

The interchange with the Shantung Railway in Tsinanfu has developed in a satisfactory manner.

5. Staff. In the latter half of the year 1912, the gradual completion of the work compelled us to dispense with the services of a part of our Chinese and European staff, in the case of the latter on expiry of their respective contracts. We take this opportunity of once more expressing our thanks for their devoted co-öperation to these as well as to the present members of our staff.

Report of the Engineer-in-Chief.

Mr. J. Dorpmüller, Engineer-in-Chief, reported as follows:—

In the course of the year 1912, the following work was carried out:

A. **North of the Hwangho.**—The ballasting of the line was completed. The brick kilns were shut down with the exception of three kilns near Tientsin which were kept working for supplying the requirements partly of the railway and partly of private consumers of bricks, tiles, etc.

Of actual construction work, the protection of all bridges and culverts was perfected in 1912. In consequence of the experience had in August, 1911, on the occasion of the Yunho breaching its banks, the wings of the abutments of bridges and culverts were extended along the embankments, the bottoms of culverts strengthened with concrete re-inforced by wire netting or with a thick floor of masonry laid in cement, their in and outlets safeguarded against the scouring and undermining action of the water by means of far extending additions to the masonry foundations of the bottoms, and these foundations themselves secured by means of especially deep reaching inverted external vaults.

With the exception of the erection of quarters for the police and the extension of the shunting and loading sidings of a number of stations, actual construction work was confined to the vicinity of Tientsin. A goods-yard with shed was added to the Tientsin West Station and an approach road of one kilometer length newly laid out. The erection of the station building at Tientsin West was left over for 1913.

At the Tientsin workshops, the outer wall and quarters for a European foreman and for the workmen were put up and the loco shed enlarged by two stalls.

All construction sections north of the Hwangho were abolished

A start was also made with pulling down the jetties and the temporary stations at Pehhwangho and Chiaoshan on the North bank of the Hwangho which had become disused on the completion of the Hwangho Bridge.

B. The Hwangho Bridge.—During 1912, the three main river spans were erected, the foot paths put in and the track laid on the bridge.

On November 16th, the last rivet was driven and on November 30th, the bridge submitted to the loading tests, immediately after which the first passenger train just arriving from Tientsin was taken across the bridge.

C. The Working in and near Tsinanfu—The earth work for the interchange station between our station and the Tsinanfu West station of the Shantung Railway was completed, the metals laid and a station building put up. For the loco station Tsinanfu, a loco shed with ten bays was erected, a water tower with pumping plant, a coaling platform and quarters for the loco staff, followed in turn by the construction of the overhead bridge at the extremities of the station, guards' and pointsmen's cabins, the goods-shed, the police quarters and of the station building proper of our Tsinanfu main station, which will be completed by about middle of 1913. All sidings of this station as well as its connections with the main workshops, the Shantung Railway and two private sidings were finished.

On the premises of the main workshops at Tahuishu, the year 1912 saw the completion of the building of the main shed and the erection of the plant in all other shops except the machine and the locomotive repair shop. Operations were started in the Blacksmith's shop and in the foundry.

Of the power house, the masonry work was finished and the machine plant was nearly installed. Police quarters had been put up on the premises of the main workshops and a road laid out connecting the same with Tsinanfu.

A siding running down to the port of Lokou was laid on the dyke of the Hwangho.

D. South of Tsinanfu.—As far as the line had been under traffic for some length of time already, i.e. down to about Yenchowfu, further work was confined to protectionary measures and to ballasting, great value being attached chiefly to the safeguarding of bridges and culverts. On account of the insecurity of the country, considerable sums had to be spent on quarters for the police and their officers. South of Yenchowfu the line was at the beginning of 1912 in quite a provisional state; only the track itself was laid right through. At about thirty points, where the bridges were not completed yet, the track was carried across rivers on emergency bridges or through dry river beds by means of deviations. As the latter had to be removed by the beginning of the rainy season, keen

activity set in on this section of the line with the result that all deviations were actually displaced by the middle of June. Simultaneously, the earth work for the extension of some of the more important stations, particularly of Yenchowfu and Lincheng, was taken in hand as well as the ballasting of the line, for which purpose in part coarse sand was available. Eleven station buildings, fifty guards' and pointsmen's cabins, three water stations at Yenchowfu, Chieho and Lincheng with the requisite pumping plant, pipe lines, stand pipes and water towers were erected, besides a loco shed of six stalls each at Yenchowfu and Lincheng with the necessary turn tables, coaling platforms, workshops and workmen's quarters, and further quarters for the traffic and maintenance staff at Yenchowfu and Tenghsien.

With the completion of these works, the buildings on the main line were practically finished.

On January 15th, 1912, construction sections VII and VI were joined and on July 1st, 1912, construction sections VIII and IX.

E. **The Branch Lines.**—*1. Lincheng-Tsauchwang.*—The embankment including the bridges having been completed in 1911, the metals were laid in 1912, beginning from Lincheng. Traffic was opened on May 25th. The earth work for the stations at Chow Wu, Tsitsun and Tsauchwang was finished and the sidings laid. As on the main line, protectionary measures for safeguarding the bank and buildings were perfected. The work in connection with this branch line was finished with the completion of eleven guards, cabins, three station buildings with attached police quarters and a small loco establishment with water station. The ballasting of this line was proceeded with.

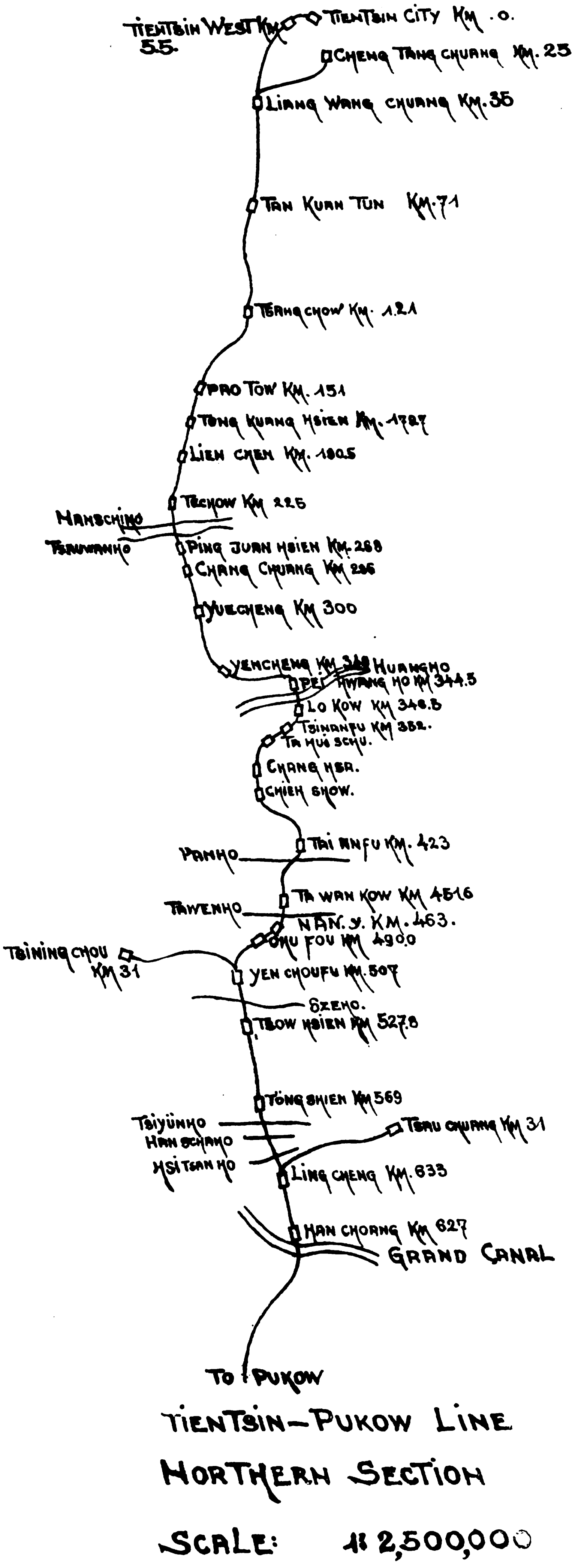
2. Yenchowfu-Tsiningchow.—In the spring of 1912, the pegging out of the approximately thirty-two kilometers of this line was completed, followed immediately by the purchase of the land and the commencement of the earth work.

Owing to a comparatively dry summer, a speedy supply of construction material was rendered possible over the country roads, a task which would have presented great difficulties under less favourable conditions. We were thus enabled to complete the earth work as well as the bridges and culverts by the end of August and to commence in the beginning of September with the laying of the metals, through traffic over this branch being opened on November 10th. As the banks have not had any rain to stand and are, in consequence, not settled yet, it is to be expected with certainty that they will give us some trouble during the next rainy season. In consideration of the inevitable loss of ballast during the settling process of the banks, the road has been temporarily ballasted with sand. Twelve guards' cabins, three pointsmen's houses and provisional station buildings at Sunszetien and Tsining were erected, and for the shed and the turn table of a small loco establishment in Tsining the foundations were just completed within the year under review.

(*Continued on the next page*)

An American estimate of crude oil used by the railways of the United States for fuel in 1912 is 32,000,000 barrels. That was an increase of over 4,000,000 barrels 1911. Since 1906 there has been a gradual increase in oil consumption by railways, with the exception of 1908, when it fell about 2,000 barrels compared with the previous year.

According to the *Abrasive Age* there is on board the battleship Pennsylvania a neat device for peeling potatoes. It consists of a large sheet iron cylinder provided with a revolving disc as a bottom. The entire inner surface of the peeler is impregnated with carborundum grain. By rotating the bottom, the potatoes are whirled about against the sharp carborundum grains, while a stream of water flows down upon them and flushes off the parings. It requires less than a miuute to remove the skins from the potatoes.



Balance-Sheet. December 1912.

CAPITAL AUTHORISED AND RAISED BY DEBENTURE STOCK.

Details	Nominal value of bonds	Rate of issue	Amount of discount	Actual amount realised		Remarks
	£		£	£	Kooping Tls.	
Under Loan-Agreement 1908 £3,150,000.						
First issue	1,890,000.—	93	132,300.—	1,757,700.—	13,667,058.943	
Second issue	1,260,000.—	94½	69,300.—	1,190,700.—	9,350,282.166	Interest is payable at the rate of 5% per annum on the nominal value of the bonds.
Under Supplementary Loan Agreement 1910.						
First issue	1,890,000.—	93	94,500.—	1,795,500.—	13,157,862.641	
Second issue	(1,410,000.—) (not issued)	—	—	—	—	
	5,040,000.—		296,100.—	4,743,900.—	36,175,203.750	

TEMPORARY LOANS ON ACCOUNT OF UNISSUED PART OF SUPPLEMENTARY LOAN.

Details	Amount in £	Amount in Kooping Taels	Remarks
Tientsin-Pukow Railway Southern Section through Hongkong-Shanghai Bank.	250,000.—	1,832,061.075	Interest 4% per annum to be paid to Southern Section.
Deutsch-Asiatische Bank, Berlin	662,272.2.4	4,853,291.858	Interest 7% per annum.
	912,272.2.4	6,685,352.933	

CAPITAL BALANCE SHEET OF DECEMBER 1912.

Heads of Accounts	Debit Tls. cts.	Credit Tls. cts.
Capital . . . . £4,743,900.—.—.		36,175,203.750
Temporary Loans . . . . £ 912,272.2.4.		6,685,352.933
Deutsch Asiatische Bank, Tientsin	63,005.111	
" " " Berlin	2,080.395	
Capital Cash Account (1)	83,728.809	
Interest on loan	6,495,686.103	
Interest received on bank deposits		1,114,005.449
Commission on Purchases	766,348.667	
Remuneration to the Syndicate and loan-service-expenses (2)	1,005,174.682	
Exchange		63,230.165
Traffic Earnings less traffic-expenditure		2,048,959.574
Directorate General, Peking	416,302.275	
Various Debtors	41,124.154	
Various Creditors		734,805.407
Foreign Railways		29,405.031
Final Heads as per Schedule A.	37,038,427.851	
Suspense Account as per Schedule B.	939,084.262	
	46,850,962.309	46,850,962.309

1. Cash on hand and at Chinese Banks
2. According to articles 20 and 7 Tientsin Pukow Railway Loan Agreement.

SCHEDULE A. CAPITAL FINAL HEADS.

	Heads of Account	Expenditure during the year 1912 Tls. cts.	Expenditure from the Commencement of operations Tls. cts.
*I.	Landpurchase	1,616,875.151	1,813,795.508
II.	Earthwork, etc.	273,936.319	1,713,359.227
III.	Enclosures, excl. of the stations	2,067.960	3,691.796
IV.	Level crossings	44,000.127	62,655.747
V.	Bridges and passages	1,970,311.977	7,759,863.652
Va.	Hoangho-bridge	1,439,922.639	4,545,611.418
VI.	Tunnels	—	—
VII.	Superstructure on the mainline on the stations	3,406,407.795	9,311,924.758
VIII.	Signals and telegraphic signs	163,660.879	576,282.889
IX.	Stations and Buildings	644,765.274	2,286,959.540
X.	Workshops and Stores	257,058.221	710,764.061
XI.	Extraordinary Works	25,152.708	166,793.362
XII.	Rolling Stock	369,629.179	4,021,162.524
XIII.	General Charges	520,078.878	3,411,413.472
XIV.	Extraordinary	65,342.801	327,049.101
XV.	Railway Police	164,386.292	327,100.796
	Total	10,963,596.200	37,038,427.851

* Heading I.

The amounts paid for landpurchase by the Land Office and the Land Office Tsinanfu have not been verified so far by the Engineer-in-Chief.

SCHEDULE B. SUSPENSE ACCOUNTS.

Head of Accounts	Debit Taels cts.
Materials afloat	4,559.958
Head Store	70,946.650
* Store Tsinanfu.	754,889.935
Stores Divisional.	46,547.216
Telegraph Store	30,067.063
Fuel and Oil Account	9,859.585
Printing and Stationery	9,064.096
Miscellaneous Advances	10,665.709
Traffic Receipts	2,484.050
	939,084.262

* Store Tsinanfu.

The amount placed at the debit of this account does not give the final statement end of December, the final accounts having been retarded by stress of work, a final stock taking has been made middle of April.

TRAFFIC-EARNINGS OF THE YEAR 1912.

1912	Passengers $ cts.	Goods $ cts.	Total $ cts.
January	—	—	192,141.28
February	—	—	140,593.90
March	—	—	184,290.96
April	157,671.25	62,016.11	219,687.36
May	152,642.38	54,005.55	206,647.93
June	116,993.77	40,955.05	157,948.82
July	123,870.40	52,876.64	176,747.04
August	137,990.80	78,236.26	216,227.06
September	148,796.58	128,173.16	276,969.74
October	171,089.05	167,788.26	338,877.31
November	179,885.82	151,010.72	330,896.54
December	197,438.73	190,993.60	388,432.33
			$ 2,829,460.27

THE TWO NEW PACIFIC EMPRESSES

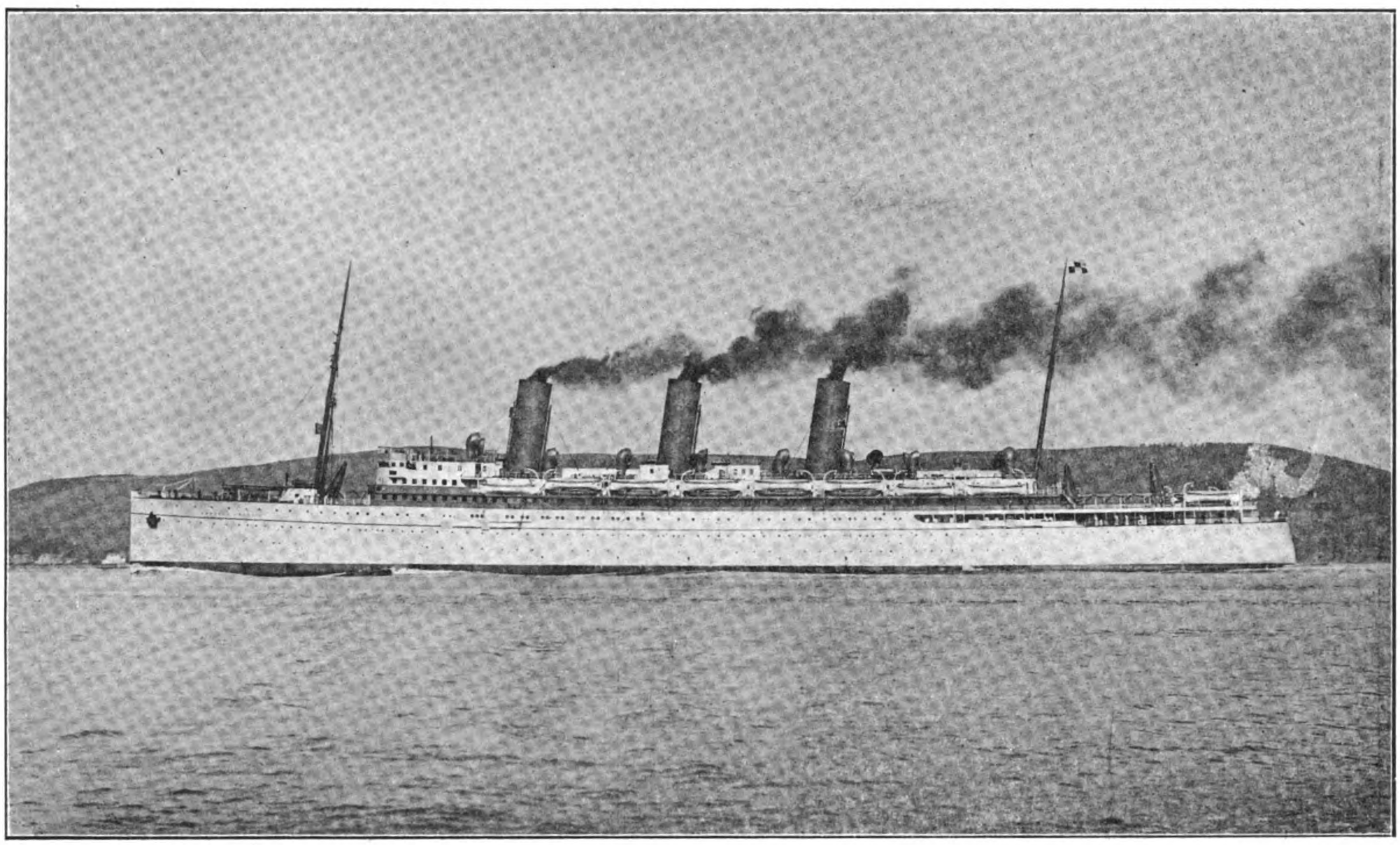
The Empress of Russia has already taken up her duties on the run between Hongkong and Vancouver, and has reduced the duration of the ocean voyage from Yokohama to Canada to 9½ days. She will shortly be joined in the service by the Empress of Asia, now on her way out via the Cape of Good Hope. The two sister ships are each of about 590 feet in length, 68 feet in breadth, and 46 feet in depth, and of 16,850 tons gross, with a service speed of 18 knots, and are the largest on the Pacific route. They are propelled by four screws driven by four sets of Parsons turbines. Steam is provided by an installation of ten boilers, working under Howden's system of forced draught at a steam pressure of 190 lbs. per square inch. A departure from current practice was made in deciding to construct the vessels with cruiser sterns and rudders entirely underhung. This form of stern besides giving the vessels a very distinctive appearance, increases the effective length of the waterline, and so assists propulsion besides adding considerably to the available deck space at the after end. The vessels have double bottom, orlop, lower, main, upper and shelter decks. Above the latter there is a long combined forecastle and bridge, the bridge deck being extended to the stern on side stanchions. Above the bridge deck there is a promenade deck about 350 feet long, on which are the principal first class public rooms, over this again are the officers's quarters and navigating bridge.

In order to ensure the safety of the vessels, the hulls are subdivided by numerous watertight bulkheads, closely spaced, one effect of which will be that any four compartments can be opened to the sea and the vessel will remain afloat. It may be mentioned that hitherto the Board of Trade standard has been that a vessel should remain afloat after the flooding of any two compartments.

INTERNAL ARRANGEMENTS

We extract a few items of interest from the full description of the vessels. The ships have each accommodation for 200 first-class, 100 second-class Asiatic and for 800 third-class Asiatic passengers, and will have a total complement of 475 officers and crew. The hold, orlop and lower decks beyond the machinery spaces are arranged to carry general cargo. On the shelter deck just forward of midships is situated the first class reception room and café, measuring 44 feet by 64 feet, with large embarking gangways on either side of the ship. Adjoining the café on the aft side is the main saloon 74 feet long and 64 feet wide, lit from above by a large well 26 feet by 16 feet, and from the sides by a number of beautifully designed windows nearly 5 feet wide. The tables are arranged to suit the demands of various passengers, from small tables for two and four persons to semi-private tables for six arranged in alcoves, and larger tables for larger parties. In the central part of this deck is fitted the main kitchen, the pantries, cold larders, bakery, etc., equipped with all the latest hygienic and labour-saving devices necessary for serving the first and second-class passengers. To minimize the running to and fro a number of electric lifts have been fitted between the main kitchens and the various stores and deck-pantries on the bridge and promenade decks above. Indeed the culinary department has received the most careful consideration and everything possible has been done to make it efficient. The first and second-class kitchen is fitted with a large central range, silver grills, steam stockpots, bain maries, hot closets, electrically driven roasters, potato peeling machines, and every conceivable labour-saving device. The bakery is fitted with water-tube ovens of the latest type, and the bakers' shop contains dough-mixing, ice cream machines and refrigerators. The hospitals, laundry, etc., are at the extreme end of the ship on the shelter deck. Ascending the grand staircase from the reception room the first-class state rooms on the bridge deck are reached. These rooms are enclosed in a complete steel deckhouse 340 feet long. Each measures 10 feet by 9 feet, with sleeping berths for two persons, and a couch convertible into a third bed in case of necessity. The sleeping berths are so designed that should the cabin be occupied by only one passenger, all evidence of the other berth is hidden, leaving only a single brass bedstead. Another feature is that two staterooms can be converted into one suite, with dressing room with hot and cold water adjoining. Surrounding the deckhouse is one of the first-class promenades, on either side of the house on the straight; this promenade is no less than 430 feet long, with a minimum width of 8 feet, while at the end it extends for 100 feet from side to side of the ship.

At the head of the grand staircase is situated the promenade deck, with a deckhouse 320 feet long by 44 feet broad, in which are first-class staterooms for one or two persons, handsome parlour suites of two, three and four rooms, all self-contained with bath room, dressing room, etc. Further aft a writing room has been introduced, and at the end are a smoking room and verandah café occupying a space 57 feet long, 43 feet broad and 14 feet high. Around the deckhouse is an open promenade with screen protection at the forward end, similar to that on the bridge



The above is a picture of the C. P. Ry. Company's new steamer, Empress of Russia, which with her sister ship, the Empress of Asia, has recently been completed by the Fairfield Company. The cruiser stern, besides giving the vessels a very distinctive appearance, adds considerably to the deck area at the after end of the vessels.

deck, while on the house top is a large gymnasium, fitted up with a large variety of exercising machines.

The outstanding feature of the vessels is the size, design and quality of the public rooms, parlour suites, special and ordinary staterooms, also the large proportions of the second-class and Asiatic accommodation. The public rooms in the Empress of Russia are fitted up in the style of the Louis XV and Louis XVI periods, while in the Empress of Asia these rooms are decorated in English style, that of the Georgian period. Space forbids a description of the arrangements for heating and cooling all the apartments of the ship, for lighting, ventilating, etc. The equipment includes, of course, the long range Marconi system.

THE MACHINERY

The propelling machinery consists of four turbines of the Parsons type, embodying the most recent improvements in design and construction to ensure the maximum economy of fuel consumption on service being attained. The port wing shaft will be driven by a h.p. turbine which will exhaust into a l.p. turbine driving the starboard wing shaft. The two inner shafts are each driven by a l.p. turbine which has a powerful astern turbine incorporated in the same casing.

The introduction of an i.p. turbine to the installation will provide a much wider range for the expansion of the steam, and will effect a marked improvement in steam consumption as compared with the usual arrangement of turbines, driving either three or four shafts, hitherto adopted in large mail ste mers and naval vessels. Hitherto these have been fitted with either one h.p. turbine exhausting to two l.p. turbines, or two h.p. turbines exhausting to two l.p turbines. For manœuvring when entering or leaving harbours, independent high pressure steam connections are provided on each l.p. ahead turbine. An independent high pressure steam connection has also been provided on the l.p turbine, which, combined with a suitable arrangement of valves, enables the h.p. turbine to be cut out, or should the i.p. turbine be out of action, the h.p. turbine can exhaust direct into one or other or both of the l.p. turbines. The four turbines are situated in one watertight compartment and in a separate compartment immediately aft the two condensers are placed, together with the circulating pumps, dual type wet and dry air-pumps, evaporators and distillers. The circulating pumps and air-pumps form two distinct and separate sets, each set working in conjunction with one condenser, and independent of the other, but are also arranged with suitable cross connections so that either set of pumps can, in case of emergency, work in conjunction with both condensers. The installation of auxiliary machinery is exceptionally large and, as in the case of the turbine installation, has been designed with a view to securing the greatest economy in fuel consumption and convenience in working. The feed water system for the boilers comprises two twin filters of the gravitation type, through which the water from the air-pumps is discharged on its way to the hotwell tanks; two hotwell pumps which discharge the feed water, first through a surface feed water heater and afterwards through a contact feed heater, from which the four feed pumps take their supply and discharge direct to the boilers. The feed water is heated by the exhaust steam from the auxiliary machinery throughout the ship, the steam from ship's heating systems and drainage systems from steam pipes, &c. The system evolved is the result of careful consideration, and will ensure that all waste heat from the auxiliary steam and exhaust systems are utilised in heating the feed water instead of the heat being carried away by the circulating water from the condensers.

For harbour use a separate auxiliary condenser with circulating pump, air-pump, feed filter and feed pump is fitted to admit of the corresponding auxiliary machinery used on service being opened out for cleaning and examination as necessary. All the bearings for the turbine and line shafting are connected to the forced lubrication system, and the oil supply is maintained by four large oil pumps which discharge the oil through special coolers before entering the bearings. Separate pumps are fitted for circulating cold sea-water through the oil coolers. Drain tanks, into which the oil gravitates from the bearings and settling tanks for separating any water or impurities from the oil, are fitted in the condensing room. The pumps for ship's service consist of two general service pumps, three sanitary hot and cold water pumps, two bilge pumps, two fresh-water pumps, and a ballast pump.

Steam is generated in six large double-ended boilers and four single-ended boilers, situated in three separate compartments, and working under the Howden system of forced draught, the air supply being maintained by an installation of electrically driven fans fitted in duplicate and situated on the main deck. Two pole masts and three large and well-proportioned elliptical funnels, one for each boiler compartment, give the vessel a strikingly handsome appearance. For dealing with the ashes at sea, See's ash ejectors are fitted in each stokehold, and in each boiler compartment a specially designed ash ejector pump for supplying the water under pressure to the ejectors is fitted. Steam ash hoists of a silent type are also fitted in each boiler compartment for harbour service. The ash hoisting arrangements have received special consideration in order to minimise the noise which is so objectionable, and this machinery has therefore been removed entirely from the vicinity of the passenger quarters

THE ALLAN LINER CALGARIAN

The approval, which the novel features embodied in these two new vessels has met with in ship-owning circles may be gauged from the fact that the Fairfield Shipbuilding Company have already launched a new turbine steamer of similar design. This is the Calgarian destined to ply between Liverpool and the St. Laurence in the service of the Allan Line. A quadruple screw turbine steamer of 590 feet length, 70 feet beam and 54 feet in depth to bridge deck, she is of 18,500 tons gross and will have a service speed of 18 knots. Fitted like the Empress steamers with straight stems and cruiser stern with underhung and submerged rudders, she resembles these vessels very closely in external appearance. As in the case of these steamers her propelling machinery will also consist of four Parsons turbines of latest design similar to those of the Empresses. She will carry 200 first-class, 500 second-class and 1,000 third-class passengers, and the arrangements for the safety of the ship and her passengers contain all the latest improvements. These include automatically self-closing watertight doors in bulkheads on the Stone-Lloyd system, a double bottom extending well up the bilges, while in case of ultimate necessity there will be sufficient boats to carry all on board as well as a life jacket for each person.

In addition to the usual light and sound signals and a powerful wireless installation, the Calgarian will be fitted with submarine signalling apparatus, which will enable those in charge to ascertain the relative position of any ship or station similarly equipped.

The Georgian style will rule in all the public rooms and cabins of the Calgarian.

"THE FAIRFIELD RECORD"

The Fairfield Company has a wonderful record of success in the building of merchant vessels and yachts of all classes. The following well-known steamers are Fairfield productions: The Atlantic liners Campania, Lucania and Empress of Britain, the South African liners Armadale and Balmoral Castle, etc., the Egyptian mail turbine steamers Heliopolis and Cairo, and a long list of ocean and channel turbine steamers. Among yachts the following productions of the famous yard are noteworthy: the Imperial steam yacht Livadia built for the Czar Alexander II, the Spanish Royal yacht Giralda, and the Lady Torfrida, the property of Sir Marcus Samuel. In war vessels of all classes and for many governments the record of the yard is no less remarkable. The British battle cruiser Indomitable which conveyed His Majesty, when Prince of Wales, to the Centenary Celebrations in Quebec, scored a notable success by her record run across the Atlantic, at an average speed of 24.8 knots. Other successes have been the battle-ship New Zealand, the cruiser scout Forward, and a whole host of destroyers, torpedo boats and other craft. The Fairfield Shipbuilding Company are closely associated with Messrs. Cammell Laird & Co., Ltd., of Sheffield, Birkenhead, etc., and the Coventry Ordnance Works, Ltd., and the combined resources of the three companies enable them to build, engine, arm and equip to the last detail war vessels of any class whatever. The three companies are all represented in the Far East by Messrs Samuel & Co., Ltd., of Shanghai, etc.

THE NEW SINO-JAPANESE COMPANY.

The China Development Company, Ltd., of Japan, held its inauguration meeting on 11th Aug. in Tokyo. Mr. Kurachi, formerly Vice-Minister of Foreign Affairs, who is now a member of the House of Peers, was elected as Vice-President. Mr. Ozaki (formerly of the Mitsui Bank) and Yin Hsi-chang (of Shanghai), Managing Directors, Mr. Mori (of Mitsui and Co. of Shanghai), Wang I-ting and Chang Jen-chi, Directors, while Mr. Ohasi and Shen Man-yun, the auditors, were elected at the meeting.

The China Development Company, Ltd., has a capital of Yen 5,000,000, each divided into 50,000 shares Yen 100. Most of the leading Japanese concerns have become shareholders, among whom the following may be mentioned:—

	Shares.
Industrial Bank of Japan Ltd...	1,000
Nippon Yusen Kaisha	1,000
Osaka Shosen Kaisha	1,000
Mr. Yagyu (President of Bank of Taiwan)	1,000
Mitsui & Co., Ltd..............	1,000
Mitsu Bishi & Co., Ltd..........	1,000
Okura (Proprietor of Okura & Co.)	700
Sumitomo	700
South Manchuria Railway Company	600
Baron Shibusawa	600
The 1st Bank..................	500
The 100th Bank................	500
Nakagawa (Vice-President Bank of Taiwan)..................	500

and many others, of whom Messrs. Inouye, Odagiri, the Directors of the Yokohama Specie Bank, and Nisshin Kisen Kaisha may be mentioned.

The objects of the Company are numerous, among which the following may be mentioned:—

1.—To undertake investigation, designs and plans, to take up or introduce any development enterprise in China.

2.—To finance such enterprises, either directly or indirectly.

3.—To accept any bonds or undertake the same.

4.—To finance or take up trusteeship.

The main office will be at Tokyo and a branch in Shanghai.

There are many Chinese shareholders, mostly of Shanghai, including Chu Pao-san, Ku Shan-yi, Wu Ching-tang (of Kobe), Wang I-ting, Chang Jen-chi, Li Ping-su, Chow Shin-kau, Yin Hsi-chang, etc.

KOWLOON-CANTON RAILWAY

(British Section)

ANNUAL REPORT FOR 1912

Mr. H. P. Winslow, Manager of the British Section of the Kowloon-Canton Railway, in his report for 1912 says:—

Construction

At the end of 1911 little construction work remained to be done with the exception of building the Terminal Station at Kowloon. The site for this has been under discussion during the year and it was finally decided to purchase K.M.L.'s 3, 9, 74 and 75. It was also necessary to acquire a portion of the land in the occupation of Messrs. Holt & Co. to gain access to the proposed New Station, and this has been arranged by exchange of an equal portion from Railway property. Mr. A. B. Hubback, F.R.I.B.A., Government Architect for the Federated Malay States, was, by the courtesy of the Chief Commissioner, appointed architect and submitted plans before the end of the year, which were approved. Work was commenced by raising the Praya Wall at Kowloon Point to such a level as to ensure the safety of the Yard against flooding during typhoons. The demolition of the warehouses and other buildings on the site was completed, the Head Offices of the Railway being transferred to a temporary building which on the completion of the new Station will be converted into quarters for the Staff. A considerable amount of preliminary work has also been done in the laying out of temporary sidings, the collection of building materials and the transportation of these to the site.

2. The pitching, draining and plastering of Cuttings Nos. 1 and 44 have been completed. An extensive catchwater drain above Cutting No. 47 has also been constructed, and it is hoped that this Cutting will give no further trouble

3. The Engine Pits in the Locomotive Running Shed mentioned in my last report were lengthened during the year to accommodate the two new Main Line Engines, and a contract for the construction of an extension to the Shed over these pits has been let to a local firm.

4. The Branch Line from Fanling to Sha Tau Kok was completed and opened to traffic on April 1st. Two sidings were laid, one at 1½ and one at 4 Miles and a passing loop at Wo Hang Station.

Station Shelters have also been erected at each of the four Stations. This line is not ballasted with stone and considerable attention had to be given to it during the wet weather, but it is now in good running order.

Maintenance.

5. There have been no slips to either Cuttings or Banks during the year. The pitching to Bridge No. 10 (3 Spans of 40 feet, 40 feet high) was badly blown round the South abutment and the necessary repairs have been carried out.

6. The Main Line is now in a high state of efficiency. The road bed has become thoroughly consolidated and safe for the fastest speeds required. It was found necessary to lengthen the Sidings at Kowloon and Fanling Stations and to provide a fourth road of 1,200 feet at Hung Hom Station, for shunting operations.

7. The Signalling System has been improved by the adoption of a key box at each station, which holds the keys for locking the facing points, and only allows the proper combination of keys to be withdrawn at one time, all other keys remaining locked in until the first are returned. An advance Outer Signal has been erected at Hung Hom over the big Cutting. The work for the above was executed in the Railway Workshops.

8. The two additional Locomotives ordered from Home in 1911 and expected early in the year only arrived in the Colony on June 14th. The erection of the first was begun on June 22nd and she left the shops on Monday, July 8th, for her first steam trial, and was handed over to the Traffic Department on July 19th. The second made her first trial run on July 29th and was available for Traffic on August 2nd.

9. The erection of eight new carriages was commenced on the 13th of March. The first was completed on May 27th and the last on August 20th. All the First and Second Class Coaches have been fitted with electric fans.

10. For the Fanling Branch six two-foot Gauge Wagons with a capacity of 62 cubic feet were built and the six passenger Coaches were also fitted with new underframes with dust proof axle boxes.

11. The following are the most important works carried out in the Workshops during the year:—

One Second Class Carriage converted into First and Second Buffet Compo.

One Third Brake converted into Kitchen Brake

One Third Class into Second Class.

Two 30-Ton Covered Goods converted into Emergency Thirds to carry 100 Passengers each.

No. 5 First and Second Class Compo, was taken into the shops on September 2nd for general overhaul and revarnishing and returned to Traffic on October 4th.

No. 5 Hudswell Clarke Saddle Tank Locomotive has been thoroughly overhauled and fitted with axle boxes and a new fire box.

No. 1 Kitson Loco was supplied with a new set of coupled wheel axle boxes, the castings being obtained locally and machined in the shops.

12. As already stated two locomotives were expected early in the year, but did not actually arrive until the end of June. Some anxiety was occasioned when it became necessary to inaugurate an increased train service and, although only two locomotives were available, I am glad to say that this was effected and the service efficiently maintained, which reflects great credit on the Locomotive Staff.

Account—Capital.

13. The Expenditure to December 31st, 1911, on the Construction of the Railway was for the Main Line $11,984,515.13 and for Fanling Branch Line $36,987.64, making a total of $12,021,502.77.

During the year under report a further sum of $1,783,093.00 was voted by the Legislative Council. The purchase of the Station Site and also of Kowloon Inland Lot No. 1,132 for a residence for the Manager accounted for $1,515,879.25 and the two Locomotives and eight Coaches ordered in 1911 were paid for, the total under Main Line Account being $1,729,550.54, but credits afforded by sale of Construction Plant and profit on exchange reduced that figure by $487,418.58 and the net expenditure for the year stands at $1,242,131.96. On the Fanling Branch the 14 lb. rails put in were replaced by a heavier section rail. The amount expended was $20,790.55. The Expenditure against the Grant of $1,783,093.00 was $1,262,922.51 and shows a saving of $520,170.49.

Revenue and Expenditure.

14. The Revenue statement of earnings and expenditure shown in this Report follow the lines adopted last year. The Expenditure of all Departments has been carefully watched, and apart from the $25 88 shown as Special and Miscellaneous, the Estimates have been exceeded only in the case of Locomotive Expenses. The Excess under this heading amounts to $22,694.10 and is mainly due to an inadequate estimate of the amount of Coal required, only $13,500 being provided while the actual cost of Coal consumed was $29,743.99 It is probable that the improved Train Service was not contemplated at the time the Estimate was prepared.

15. The provision under General Stores also proved insufficient, and in addition it was found necessary to fit a new set of axle boxes to No. 1 Locomotive.

16. It will be observed that the Working Expenses compared with Gross Receipts show a marked decrease on the previous year. The actual working expenses were $207,350.78 against an estimate of $200,973.00. The Excess in the Locomotive Expenses, which is fully explained in the preceding paragraph, was reduced by savings in other Departments and the total Estimate was exceeded only by $6,377.78.

Revenue.

17. In view of the unsettled conditions prevailing in the Kwangtung Province it was not to be expected that Through Passenger Traffic would reach the estimated figure, and although fares were reduced and every encouragement offered, the Revenue from this source was disappointing. An increase of both passenger and goods traffic might be looked for when connection is made with the Canton-Hankow Railway.

18. The Revenue derived from Local Passenger Traffic is slightly less than in 1911. Every effort was made to secure goods, but development is slow and through goods traffic has been discouraged by the imposition of Likin. It is hardly likely that much improvement will be shown under the existing conditions.

19. It is gratifying to note that the Revenue exceeded working expenses by $34,298.24 which under the adverse circumstances may be considered satisfactory. Interest on Capital Account has not, however, been included in the Railway Account this year, as it was decided to debit this in future to the Public Debt.

20. It is regretted that the subject of Division of Joint Sectional Passenger Fares is still in abeyance, but it is hoped that this difficult question will soon be settled when the final adjustment between the two Sections may be affected.

21. I am pleased to report that the transactions of the Stores Branch have been efficiently carried out. The Stores are in excellent order and demands generally have been promptly met. Tenders were called for at the end of 1911 for all Local Supplies for 1912.

22. A revised list of Plant for Sale has been prepared and circulated and every effort has been made to dispose of Construction Plant and Stores but sales have been few as very little work has been in progress on which Plant of such a nature would be required.

23. No fatal accident occurred to the travelling public during the year and only one passenger sustained injury due to alighting from the Express Train in motion. There were no accidents to Railway servants. In spite of all precautions Chinese continue to trespass on the Railway and four were killed.

24. There have been no changes in the Staff.

CONSTRUCTION ACCOUNT —*Main Line.*

I.	II.	III.	IV.	V.	VI.	VII.
Main Head	Sub-head	ESTIMATES. 1910.	Additions 1912.	Total.	Expenditure to 31st December, 1912.	Funds Available
		$ c.	$ c.	$ c.	$ c.	$ c.
I.—Preliminary Expenditure	Survey	42,277.65	....	42,277.65	42,277.65	....
II.—Land	Land	1,195,879.20	*1,473,879.25	2,669,758.45	2,250,185.25	419,573.20
III.—Formation	(a) Earthwork	2,587,580.00	....	2,587,580.00	2,558,410.82	29,169.18
	(b) Tunnels	3,811,145.19	....	3,811,145.19	3,807,482.63	3,662.56
	(c) Roads	120,200.00	....	120,200.00	118,363.64	1,836.36
IV.—Bridges	(a) Major	816,495.41	....	816,495.41	829,047.22	*12,551.81*
	(b) Minor	350,126.47	....	350,126.47	359,491.49	*9,365.02*
	(c) Culverts	72,546.09	....	72,546.09	71,567.78	978.31
V.—Fencing	(a) Boundaries	39,999.45	....	39,999.45	36,993.11	3,006.34
	(b) Signs	400.00	....	400.00	640.31	*240.31*
VI.—Telegraph	Telegraph	30,032.17	....	30,032.17	36,790.24	*6,758.07*
VII.—Track	(a) Ballast	130,066.54	....	130,066.54	158,703 37	*28,636.83*
	(b) Permanent Way	702,885.71	....	702,885.71	739,474.89	*36,589.18*
VIII.—Stations and Buildings	(a) Buildings and Fixtures	308,800.00	....	308,800.00	192,195.89	116,604.11
	(b) Station Machinery	40,000.00	....	40,000.00	32,494.95	7,505.05
	(c) Furnitures	5,000.00	....	5,000.00	12,323.90	*7,323.90*
	(d) Workshops	60,000.00	....	60,000.00	80,701.79	*20,701.79*
IX.—Plant	(a) Construction	101,884.53	....	101,884.53	176,360.34	*74,475.81*
	(b) Loco Tools and Plant	50,000.00	....	50,000.00	68,780.79	*18,780.79*
	(c) C. & W. Tools and Plant	10,000.00	....	10,000.00	25.00	9,975.00
	(d) Engineering	....	....	....	10.00	*10.00*
	(e) Loco Rolling Stock	74,400.00	† 45,000.00	119,400.00	193,509.63	*74,109.63*
	(f) C. & W. Rolling Stock	302,540.00	....	302,540.00	397,647.12	*95,107.12*
X.—General Charges	(a) 1. Salaries and Allowances	398,720.43	....	398,720.43	434,004.64	*35,284.21*
	2. Quarters and Offices	68,495.13	† 20,000.00	88,495.13	106,323.06	*17,827.93*
	3. Instruments	11,639.61	....	11,639.61	10,449.91	1,189.70
	4. Office Expenses	32,710.93	....	32,710.93	33,573.72	*862.79*
	5. Medical	22,319.46	....	22,319.46	23,071.90	*752.44*
	6. Home Charges	124,478.29	....	124,478.29	134,978.80	*10,500.51*
	7. Interest	713,922.67	....	713,922.67	701,705.62	12,217.05
	8. Exchange	200,000.00	....	200,000.00	*584,506.31*	784,506.31
	(b) Accounts	42,843.53	....	42,843.53	41,222.35	1,621.18
	(ss) Stores in Suspense	....	....	....	162,345.59	*162,345.59*
	$	12,467,388.46	1,538,879.25	14,006,267.71	13,226,647.09	779,620.62

N.B.—Figures printed in italics are minus quantities.

* Financial Minute No. 25

† Special Expenditure, *vide* 1912 Estimates, page 91.

Fan Ling Branch

Construction 2' 0' Gauge.

	I.	II.	III.	IV.	V.
Item No.	Main Head.	Sub-Head.	Revised Estimate.	Expended to 31st December, 1912.	Funds Available.
			$ c.	$ c.	$ c.
1.	Land	......	......	2,364.21	*2,364.21*
2.	Earthwork	IIIa	......	......	......
3.	Track Ballast	VIIa	2,000.00	11.05	1,988.95
4.	Track—Permanent Way	VIIb	29,307.00	42,218.38	*12,911.38*
5.	Station Buildings	VIIIa	1,200.00	799.68	400.32
6.	Locomotives	IXe	13,600.00	6,553.60	7,046,40
7.	Carriages	IXf	7,000.00	5,521.67	1,478.33
8.	Salaries	X a 1	1,000.00	309.60	690.40
			$ 54,107.00	$ 57,778.19	$ *3,671.19*

Item No. 1.—No provision in Revised Estimate.

Item No. 2.—Work under this Head is chargeable to Public Works Extraordinary.

Figures printed in italics in Column V denote excess of Estimate.

Construction Account—*Fanling Branch.*

Table of Expenditure, 1912.

Item No.	Main Head.	Sub-Head.	Expenditure to 31st December 1911.	Expenditure during 1912.	Expenditure to end of 1912.
1.	Land	II	2,200.00	164.21	2,364.21
2.	Track Ballast,	VII a	——	11.05	11.05
3.	Track, Permanent Way,	VII b	25,405.95	16,812.43	42,218.38
4.	Station Buildings,	VIII a	471.63	328.05	799.68
5.	Locomotives,	IX e	6,458 06	95.54	6,553.60
6.	Carriages,	IX f	2,142.40	3,379.27	5,521.67
7.	Salaries,	X a 1	309.60	——	309.60
			$36,987.64	$20,790.55	$57,778.19

Fanling Branch Line.

Maintenance of Way, Works and Stations. Current Year.

Abstract A.

	$ c.
1. Overseer in Charge,	461.74
2. Platelayers,	1,512.34
3. Stores, Oil, etc.,	18.60
	1,992.68

Abstracts B & C.

Locomotive Carriage and Wagon Expenses.

1. Wages, Drivers and Firemen,	1,127.35
2. Labour, connected with fueling, cleaning and looking after Engines in Yard,	99.31
3. Contingent Expenses, including Clothing and Travelling Expenses,	20.00
4. Labour, including Wages of Oilers, Carriage Cleaners and Examiners,	64.45
5. Oil, Tallow and Other Stores expended on Engines in Work,	450.33
6. Coal,	1,630.85
7. Wages, Repairs and Renewal of Vehicles,	686.41
8. Materials, Maintenance and Renewals of Locomotive,	629.76
	4,708.46

Abstract D.

Traffic Expenses.

1. Conductors,	874.23
2. Brakesmen,	86.22
3. Allowances to Staff in lieu of Quarters,	20.00
	980.45

Abstract E.

General Charges.

1. Printing Time Tables, etc.,	4.00
	4.00
Total,	$7,685.59

CONSTRUCTION ACCOUNT—*Main Line.*

Table of Expenditure and Statement of Credits for the year 1912.

I. Main Head.	II. Sub-Head.	III. Expenditure to 31st December, 1911.	IV. Expended during 1912.	V. Less Credits by Exchange and Sales during 1912.	VI. Net Expenditure	VII. Expenditure to 31st December 1912.
		$ c.	$ c.	$ c.	$ c.	$ c.
I.—Preliminary Expenditure, ...	Survey, ...	42,277.65	....	....	....	42,277.65
II.—Land, ...	Land, ...	776,774.45	1,473,879.25	468.45	1,473,410.80	2,250,185.25
III.—Formation, ...	(a) Earthwork, ...	2,551,554.45	6,856.37	....	6,856.37	2,558,410.82
	(b) Tunnels, ...	3,808,582.63	....	1,100.00	*1,100.00*	3,807,482.63
	(c) Roads, ...	118,363.64	....	....	....	118,363.64
IV.—Bridge Work, ...	(a) Major, ...	829,047.22	....	....	....	829,047.22
	(b) Minor, ...	359,491.49	....	....	....	359,491.49
	(c) Culverts, ...	71,567.78	....	....	....	71,567.78
V.—Fencing, ...	(a) Boundaries, ...	36,469.67	523.44	....	523.44	36,993.11
	(b) Signs, ...	640.31	....	....	....	640.31
VI.—Telegraph, ...	....	36,790.24	....	....	....	36,790.24
VII.—Track, ...	(a) Ballast, ...	158,634.97	68.40	....	68.40	158,703.37
	(b) Permanent Way, ...	729,555.34	9,919.55	....	9,919.55	739,474.89
VIII.—Stations and Buildings, ...	(a) Buildings and Fixtures, ...	176,300.70	15,975.19	80.00	15,895.19	192,195.89
	(b) Station Machinery, ...	32,143.12	351.83	......	351.83	32,494.95
	(c) Furniture, ...	11,293.28	1,030.62	....	1,030.62	12,323.90
	(d) Workshops and Stores, ...	77,293.75	3,408.04	....	3,408.04	80,701.79
IX.—Plant, ...	(a) Construction, ...	185,535.58	231.75	9,406.99	*9,175.24*	176,360.34
	(b) Loco Tools and Plant, ...	65,307.87	3,472.92	....	3,472.92	68,780.79
	(c) C. & W. Tools and Plant, ...	25.00	....	....	....	25.00
	(d) Engineering Tools and Plant,	10.00	....	....	....	10.00
	(e) Loco Rolling Stock, ...	110,611.03	82,898.60	....	82,893.60	193,509.63
	(f) C. & W. Rolling Stock, ...	289,445.51	108,201.61	....	108,201.61	397,647.12
X.—General Charges, ...	(a) 1. Salaries and Allowances, ..	433,172.65	831.99	....	831.99	434,004.64
	2. Temporary Quarters and Offices, ...	63,335.54	42,987.52	....	42,987.52	106,323.06
	3. Instruments, ...	10,654.03	51.40	255.52	*204.12*	10,449.91
	4. Office Expenses, ...	33,455.53	118.19	....	118.19	33,573.72
	5. Medical, ...	23,071.90	....	....	....	23,071.90
	6. Home Charges, ...	134,329.92	648.88	....	648.88	134,978.80
	7. Interest, ...	701,705.62	....	.....	....	701,705.62
	8. Exchange, ...	*110,997.29*	100.62	473,609.64	*473,509.02*	*584,506.31*
	(b) Accounts, ...	41,222.35	....	....	....	41,222.35
	(ss) Stores in Suspense, ...	186,769.20	*22,005.63*	1,417.98	*23,423.61*	162,345.59
	Bricks, ...	1,080.00	....	1,080.00	*1,080.00*	....
	Total, ...	11,984,515.13	1,729,550.54	487,418.58	1,242,131.96	13,226,647.09

N.B.—Figures printed in italics minus quantities.

REVENUE ACCOUNT *for the year ending December 31, 1912.*

1911	Per cent. on Gross Receipts	Expenditure	Abstract	Amount	Per cent. on Gross Receipts	1911	Earnings	Abstract	Amount	Total
$ c.	%	*Main Line.*		$ c.	%	$ c.	*Local*		$ c.	$ c.
34,272.26	23.31	To Maintenance of Ways and				107,398.05	By Coaching Traffic . . .	G	93,300.19	
		Works, ...	A	42,422.14	17.56	12,515.41	„ Goods „ . . .	H	8,649.74	
51,560.62	35.06	„ Loco, Carriage and				11,729.24	„ Sundry „ . . .	I	14,874.54	
		Wagon Expenses . .	B & C	84,616.10	35.02					
32,902.29	22.37	„ Traffic Expenses . . .	D	38,333.06	15.86	131,642.70	*Foreign.*			116,824.47
53,121.77	36.12	„ General Charges . . .	E	34,268.01	14.18					
47.00	03	„ Special and Miscellaneous				15,317.64	By Coaching Traffic . . .	G	111,432.96	
		Expenditure . . .	F	25.88	01	98.46	„ Goods „ . . .	H	7,139.15	
						..	„ Sundry „ . . .	I	..	
		Branch Line.				15,416.10	*Branch Line.*			
										118,572.11
		To Maintenance of Ways and					By Coaching Traffic . . .	G	5,782.72	
		Works, ...	A	19,992.68	82		„ Goods „ . . .	H	415.72	
		„ Loco, Carriage and					„ Sundry „ . . .	I	24.00	
		Wagon Expenses . .	B & C	4,708.46	1.95					
		„ Traffic Expenses . . .	D	980.45	41					6,252.44
		„ General Charges . . .	E	4.00	..					
										241,649.02
				207,350.78	85.81	147,058.80				
171,903.94	116.89	„ Balance Net (Earnings).		34,298.24	14.19					
24,845.14	*16.89*	„ *Loss on Working* . . .								
147,058.80	100.00			241,649.02	100.00	147,058.80				241,649.02

N.B.—Fanling Branch not in operation prior to 1912.

ABSTRACT A.

Previous Year $ c.	Maintenance of Way, Works & Stations.	Current Year. $ c.
	I.—General Superintendence:—	
6,646.07	1.—Salaries and Allowance of Engineers	6,092.26
1,171.93	2.—Sub-Inspectors' Salaries	3,430.87
—	3.—Allowances	365.81
671.24	4.—Office Staff and Expenses	3,165.66
8,489.24		13,054.60
	II.—Maintenance and Renewal of Track:—	
17,756.36	1a.—Wages—Ordinary Gangs	11,858.90
—	1b.—Wages—Extra Gangs	2,447.93
6,811.14	2a.—Ballast	3,436.37
468.87	2b.—Stores, Oil and Waste	1,087.77
94.50	2c.—Rails	112.20
—	2d.—Sleepers	46.40
—	2e.—Fastenings	—
1.20	2f.—Points and Crossings	49.58
25,132.07		19,039.15
	III.—Repairs of Bridges, etc.:—	
—	1.—Bridges and Tunnels	483.89
—	2.—Earthwork	4,468.97
2.00	3.—Fencing	84.01
—	4.—Roads and Level Crossings	80.70
22.70	5.—Miscellaneous Expenses	15.46
24 70		5,133.03
	IV.—Repairs of Station Building and Structures.	
626.25	1.—Repairs to Building of every description, including Station Yards and Signals	1,506.35
—	2.—Staff Quarters	1,200.79
626.25		2,707.14
—	*V.—New Minor Works*	2,303.11
	VI.—Unclassified Expenditure.	
—	1.—Plantations	—
—	2.—Tools and Plant	185.11
—		185.11
$34,272.26	Total,	$42,422.14

Mileage maintained by Revenue:—

Double Line,	Nil.
Single Line,	22 Miles.
Sidings,	8 do.
Total Single Track, including sidings,	30 do.
Cost per Mile,	$1,414.07

ABSTRACTS B AND C.

Previous Year. $ c.	Locomotive Carriage and Wagon Expenses.	Current Year $ c.
	I.—General Superintendence:—	
6,457.18	1.—Salary of Superintendent	3,655.36
1,041.05	2.—Allowance	—
—	3.—Subordinate Superintendent	—
1,306.34	4.—Office Staff and Expenses	1,575.01
8,804.57		5,230.37
	II.—Running Expenses, Wages connected with Working of Loco Engines:—	
5,955.83	1.—Drivers and Firemen, etc.	3,615.73
372.23	2.—Overtime Allowance	393.78
1,430.86	3.—All labour connected with fuelling, cleaning and looking after Engines in Yard	2,208.35
1,251.45	4.—Contingent Expenses, including allowances in lieu of Quarters, etc.	1,979.27
9,010.37		8,197.13
	IIa.—Running Expenses, in connection with Cleaning Carriages and Wagons:—	
4,814.07	1.—Labour, including Wages of Oilers, Carriage cleaners and Examiners	2,658.00
1,233.58	2.—Stores, including Oil Grease and other stores for consumption on Vehicles	1,588.43
6,047.65		4,246.43
12,817.15	*III.—Coal:—*	29,743.99
165.04	1.—Labour "Bunkering"	636.07
—	2.—Wood	116.00
12,982.19		30,496.06
91.22	*IV.—Water, including Wages and Stores.*	55.21
2,609.57	*V.—Oil, Tallow and other Stores expended on Engines in Work*	4,780.62
	VI.—Maintenance and Renewal of Locomotive Engines:—	
4,278.71	1.—Wages	9,313.31
37.84	2.—Overtime Allowance	—
2,460.08	3.—Material	10,711.71
6,776.63		20,025.02
	VIa.—Repairs and Renewals of Vehicles.	
	1.—Coaching Vehicles:—	
554.43	1.—Wages	2,826.54
—	2.—Overtime Allowance	213.00
479.77	3.—Material	3,313.92
1,034.20		6,353.46
	2.—Goods Vehicles:—	
3,374.77	1.—Wages	1,344.58
34.87	2.—Overtime Allowance	39.76
405.26	3.—Material	447.69
3,814.90		1,832,03
	VII.—Maintenance and Renewals of Machinery, Tools and Plant:—	
184.93	1.—Wages	1,316,37
204.39	2.—Overtime Allowance	—
—	3.—Material	3,083.40
389.32		3,399.77
$51,560.62	Total	$84,616.10

ABSTRACT D

Previous Year. $ c.	Traffic Expenses.	Current Year. $ c.
	I.—Salaries, Wages, etc.:—	
	General Superintendence:—	
5,152.77	1a.—Traffic Assistant and Inspector	4,648.58
3,170.66	1b.—Office Establishment	3,579.03
—	1c.—Travelling Allowance	—
96.00	1d.—Contingencies	—
14,402.78	2a.—Station Staff	17,081.87
4,924.52	3a.—Train Staff	6,277.01
154.24	3b.—Overtime Allowance	—
	Telegraph Staff.	
739.05	4a.—Wages	707.61
47.28	4b.—Stores	43.22
28,697.30		32,337.32
	II.—Fuel, Lighting and General Stores:—	
973.09	1.—Fuel, Lighting, Water and General Stores for Stations and Offices	1,977.31
1.62	2.—Wagon and Covers, Ropes, &c.	—
—	3.—Office and Station Fittings and Furnitures	272.24
974.71		2,249.55
553.80	*III.—Clothing.*	1,711.45
1,907.59	*IV.—Printing:—*	
	Cost of Tickets, &c.	1,521.89
	Salary of Printer	480.00
		2,001.86
—	*V.—Charges for Delivery & Collection of Goods, &c.*	—
768.89	*VI.—Miscellaneous Expenses.*	32.85
3,230.28		
$32,902.29	Total	$38,333.06

ABSTRACT E.

General Charges.

Previous Year.	General Charges.	Current Year.
$ c.		$ c.
	I.—Management, including Offices:—	
26,022.64	1.—Controlling Office	11,734.98
9,774.46	2 & 3.—Audit and Accounts Office	7,914.95
—	4.—Pay Office	2,103.23
4,928.57	5.—Stores	5,789.14
1,668.00	6.—Medical	—
1,517.32	7.—Conservancy	1,817.91
2,645.00	8.—Rent of Buildings and Land	1,234.38
899.59	9.—Furniture, Fittings, etc.	1,611.32
1,250.66	10.—Printing and Stationery	424.83
41.60	11.—Medicine and Contribution to Hospital	—
48,747.84		32,630.74
	II.—Police:—	
—	1.—Supervision	199.00
2,222.37	2.—Constables	1,093.66
241.72	3.—Contingencies (Watch and Ward other than 1 and 2)	—
2,464.09		1,292.66
	III.—Advertising:—	
1,909.84	Advertisement of all Departments	344.61
$53,121.77	Total	$34,268.01

ABSTRACT F.

Previous Year,	Special and Miscellaneous Expenditure.	Current Year.
$ c.		$ c.
—	*I.—Land Charges*	—
—	*II.—Compensation*	—
47.00	1.—For Goods lost or damaged	7.88
47.00		7.88
—	*III.—Rates and Taxes including Municipal Water Rates*	—
	IV.—Prizes for best kept length of road	18.00
$47.00	Total.	$25.88

ABSTRACT H.

Goods Traffic.

Local Earnings.

Previous Year.	Particulars.		No.	Amount.
$ c.				$ c.
12,515.41	General Merchandise,	Piculs.	142,465.72	7,268.59
.....	Government Stores,	„	3,349.00	1,077.72
......	Live Stock,	Number	1,422.00	303.43
$12,515.41	Total,		$	8,649.74

N.B.—16·75 Piculs are taken as the equivalent of a ton.

ABSTRACT I.

Sundries.

Local Earnings.

Previous Year.	Particulars.	Current Year.
$ c.		$ c.
7,800.00	Rents of Land,	11,652.52
720.75	Rents—Stall Holders, Money Changers at Stations,	419.00
1,987.95	Hire of Engines and Wagons (Maintenance),	2,194.37
354.64	Water Supply to Steam Launches,	399.15
......	Storage,	1.00
865.00	Wharfage—Blackheads Point,	155.00
—	Telegraph,	2.05
... ..	Sale of Ashes,	20.00
.90	Proceeds by sale of Lost Luggage,	1.00
......	Miscellaneous.	30.45
$11,729.24	Total,	$ 14,874.54

ABSTRACT G.

Coaching.

Foreign Earnings.

From 7th October to 31st December, 1911. Number.	Amount.	Particulars.	Current Year. Number.	Amount.
	$ c.	*Outwards.*		$ c.
257½	......	First Class,	1,391½	......
1,218½	......	Second Class,	6,795	......
14,424½	6,829.16	Third Class,	114,204	51,156.15
.....	23.58	Passengers' Luggage, Parcels, Excess Fares,	......	35.42
15,900½	6,852.74		122,390½	51,191.57
		Inwards.		
466	......	First Class,	1,882	......
2,395	......	Second Class,	7,382	......
13,803	8,417.00	Third Class,	125,319	59,493.90
......	47.90	Passengers' Luggage, Parcels, &c., &c.	......	747.49
32,564½	$15,317.64	Total,	256,973½	$111,432.96

ABSTRACT H.

Goods Traffic.

Foreign Earnings.

From 7th October to 31st December, 1911.	Particulars.		Current Year. Number.	Amount.
$ c.	*General Merchandise.*			$ c.
......	Inwards	Piculs,	58,511	3,544.67
98.46	Outwards	„	72,743	3,594.48
$98.46	Total,		131,254	$7,139.15

ABSTRACT G.

Fanling Branch Earnings.

Coaching Traffic.

Single Fare per Mile.	Third Class only. About 3 cents.		Total.	
I.—Passengers.	Number.	Amount.	Number.	Amount.
		$ c.		$ c.
Ordinary,	42,919	5,361.35	42,919	5,361.35
Monthly,	21	90.00	21	90.00
Total,	42,940	5,451.35	42,940	5,451.35
II.—Parcels,	Piculs		252.64	19.97
III.—Country Produce,	do.		1,562.00	311.40
Total,				$5,782.72

ABSTRACT H.

Fanling Branch Earnings.

Goods Traffic.

Particulars.		Number.	Amount.
			$ c.
General Merchandise,	Piculs	4,036.50	408.59
Government,	do.	412.50	37.13
Total,			$ 445.72

ABSTRACT I.

Fanling Branch Earnings.

Sundries.

Particulars.	Current Year.
	$ c.
Rent of Land,	24.00
Total,	$ 24.00

N.B.—Fanling Branch not in operation prior to 1912.

Statement of Train Mileage.

MAIN LINE.

Year ending 31st December, 1911.	Particulars.	Year ending 31st December, 1912.
Miles.		*Miles.*
49,286	1.—Train miles run for Public Traffic	84,096
1,203	2.—Train miles run for Maintenance	1,543
50,489	Total Train Mileage	85,639
16,425	3.—Miles of engines shunting and standing in steam for traffic purposes at 6 miles an hour,	73,656
......	4.—Miles run for Loco purposes,	1,500
66,914	Total,	160,795

FANLING BRANCH.

Year ending 31st December, 1911.	Particulars.	Year ending 31st December, 1912.
......	Train miles run for Public Traffic	18,948
......	Miles of engines shunting and standing in steam for traffic purposes at 6 miles an hour	10,800
......		29,748

N.B.—Fanling Branch not in operation prior to 1912.

STATEMENT OF ROLLING STOCK *for the year ending 31st December, 1912.*

DESCRIPTIONS.

Columns: 1. Total Stock at end of previous year. 2. Additions during the year. 3. Reductions during the year. 4. Total stock at end of the year. 5. Actual stock in running order on the last day of the year. Repairs and Renewals: 6. Number Repaired during the year. 7. Number Renewed during the year. 8. Number undergoing or awaiting Repairs on the last day of the year. 9. Number undergoing or awaiting Renewals on the last day of the year. 10. Average Number undergoing Repairs or Renewals at any one time. 11. Stock condemned in this and previous years awaiting replacement.

LOCOMOTIVES.

Tender or Tank.	Type.	No.	Cylinder.	Pressure per sq. in.	Tractive Force.	Total Weight in Working Order.		1	2	3	4	5	6	7	8	9	10	11
				lbs.	lbs.	Tons.	cwt.											
Side Tank	*Kitson* 2:6:4: 4′ 8½″ Gauge	4	19″ × 26″	180	24,724	89	15	2	2	0	4	4	4	0	2	2	1	0
Saddle Tank	*Hudswell Clarke* 0:6:0: 4′ 8½″ Gauge	2	14″ × 20″	150	10,604	29	7	2	0	0	2	2	2	0	1	1	1	0
Side Tank	*Hudswell Clarke* 0:4:0: 2′ 0″ Gauge	2	6″ × 10″	150	1,800	5	3	2	0	0	2	2	2	0	1	0	1	0
Loco Crane	*Wilson & Co.* 0:4:0: 5-Ton Lift.	1	8″ × 10″	80	..	15	0	1	0	0	1	1	1	0	0	0	1	0
	Total, . .	9						7	2	0	9	9	9	0	4	3	3	0

COACHING VEHICLES. 4′ 8½″ Gauge.

	Quantity.	Length of Underframes in feet.	Tare.	Carrying Capacity Passengers.	1	2	3	4	5	6	7	8	9	10	11
First Class Carriages	1	60′11″	36 Ts.	50	1	0	..	1	1	1	..	..	.. }	..	..
Second Class Carriage	1	60′11″	34 „	84	1	0	..	1	1	1	..	..	..	..	..
First and Second Composite Carriages .	2	60′11″	35 „	68	1	1	..	2	2	2	..	..	..	..	..
First and Second Composite and Kitchen Carriages	1	60′11″	35 „	60	0	1	..	1	1	1	..	..	.. }	2	..
Third Class Carriages.	8	60′11″	32 „	120	3	5	..	8	8	8	..	..	..	..	..
Third Luggage and Brake	2	60′11″	35 „	84	1	1	..	2	2	2	..	..	..	..	.
Kitchen Luggage and Brake.	1	60′11″	35 „	.	*1	0	..	1	1	1	..	..	.. }	..	..
Total, ...	16	..	..	..	8	8	..	16	16	16	..	..	..	2	..

Coaching Vehicles 2′ 0″ Gauge.

	Quantity	Length of Underframes in feet	Tare	Carrying Capacity Passengers
Carriages	6	9′ 0″	11 Cwt	10
Bogie Brake Vans	2	16′ 0″	15 „	..
Goods Wagons	6	9′ 0″	10 „	..
Total, ...	14	..	.	..

*Altered from I, II and III Brake.

GOODS VEHICLES.

	No.	Length of Underframes in feet.	Tare. Ton	cwt.	Carrying Capacity (Tons).	1	2	3	4	5	6	7	8	9	10	11
30-Ton Covered Goods . . .	5	35	15	5	30	5	..	..	5	5	5	..	..	..	..	..
30-Ton Rail Bogie	1	35	13	8	30	1	..	..	1	1	1	..	..	..	..	..
30-Ton Open Goods	6	35	14	8	30	6	..	..	6	6	6	..	..	..	..	..
15-Ton Covered Goods. . . .	16	19	8	10	15	16	..	..	16	16	16	..	..	..	..	..
15-Ton Converted Goods . . .	8	19	8	10	50 Passengers.	8	..	..	8	8	8	..	..	..	..	..
15-Ton Cattle Trucks	2	19	8	10	15	2	..	..	2	2	2	..	..	..	..	..
15-Ton Open Goods	10	19	7	16½	15	10	..	..	10	10	10	..	..	..	..	..
15-Ton Goods Brake Vans . .	2	19	15	..	15	2	..	..	2	2	2	..	..	..	..	..
Total, ...	50	..	..		..	50	..	..	50	50	50	..	..	..	..	..

ABSTRACT G.

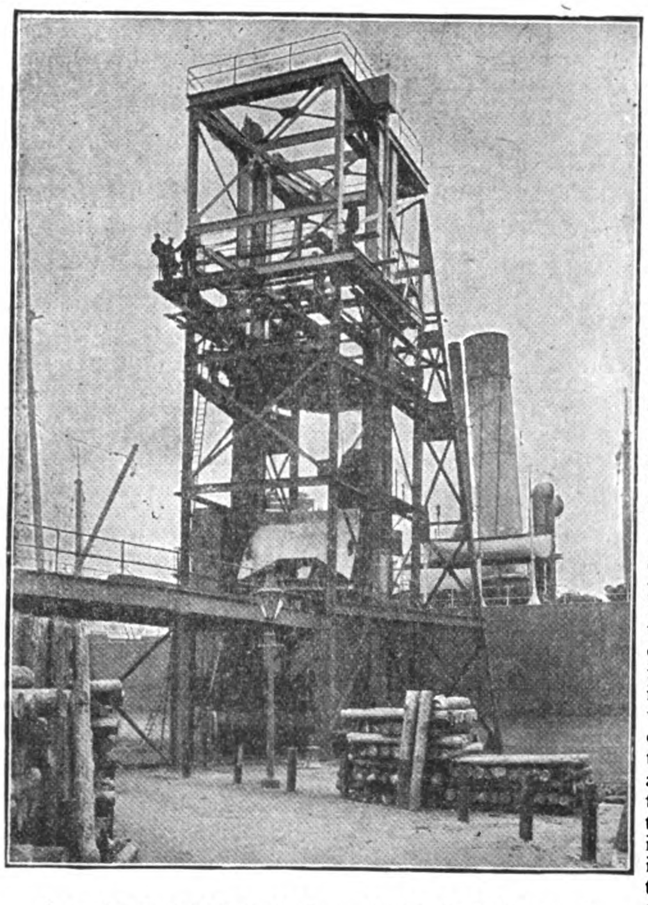
COACHING TRAFFIC.

Local Earnings.

Previous Year		1st Class		2nd Class		3rd Class		Total	
$ c.	Single Fare per Mile.	About 8 cents.		About 4 cents.		About 2 cents.			
	I.—Passenger.	Number.	Amount.	Number.	Amount.	Number.	Amount.	Number.	Amount.
	Ordinary	1,668	2,522.30	7,645	5,549.65	274,248	70,917.40	283,561	78,989.35
	Government,	662	851.25	1,541	893.90	7,585	2,800.10	9,788	4,545.25
	Monthly,	1	7.50	32	330.10	122	2,056.56	146	2,394.16
	Excursion,	1,627	2,440.50	1,422	1,273.50	1,481	888.40	4,530	4,602.40
	Excess Fare,	48	65.95	133	89.15	1,309	398.30	1,490	553.40
	Aviation,	408½	408.50	..	..	413½	165.40	822	573.90
$105,271.57	Total,	4,414½	6,296.00	10,764	8,136.30	285.158½	77,226.16	300.337	91,658.46
	Previous Year	2,910	5,751.46	12,796½	9,378.19	304,072	90.141.92	319,778½	
443.51	*II.*—Passengers' Luggage,						Piculs.	99.67	18.00
171.04	*III.*—Parcels,						„	10,117.83	192.89
1,510.13	*IV.*—Country Produce,						„	12,523.63	2,501.30
1.80	*V.*—Live Stock,						Number.	....	....
	VI.—Carriages, Horses and Dogs,						„	237.00	73.15
	VII.—Cloak Room Fees,						„	45.00	4.80
	VIII.—Special Trains,						Miles.	135.73	1,026.00
									95,474.60
	Deduct payment to Star Ferry on account of Ferry Service						....	....	2,174.41
$107,398.05	Total;								$93,300.19

THE PRESERVATION OF IRON BY "ROSPHALTIC" SOLUTION

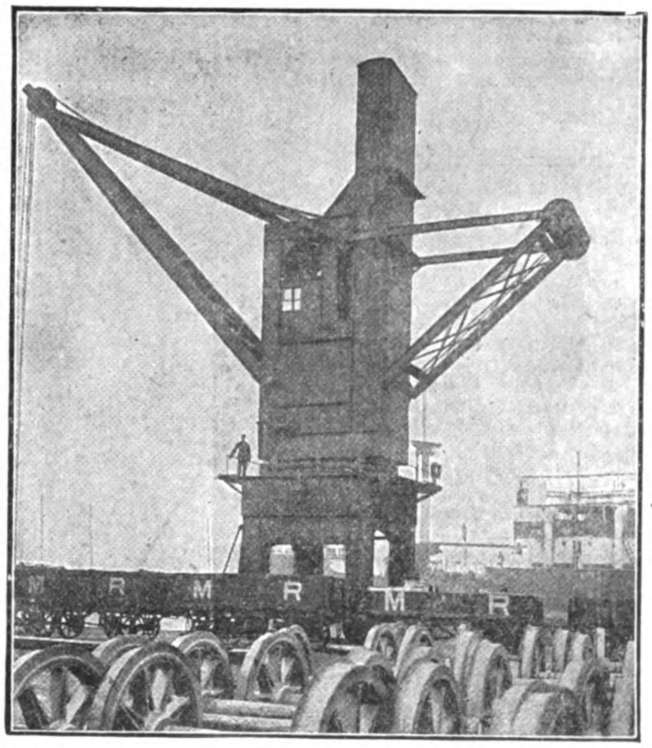
The problem of the cause of corrosion of iron and its prevention has received the consideration of scientists for a number of years. Many theories have been propounded, and much difficult experimental work carried out to prove or disprove these theories. A definite theory for the corrosion of iron has not yet been found, but is apparently not far from being enunciated. The probability is that a combination of what is known as the "acid theory" and the "electrolytic theory" will prove to be the true one, and much experimental work, some of which has been carried out by a member of the firm of Messrs. Rudd & Owen, of Hull, a chemical engineer and technical research chemist, appears to confirm this view.



One of 7 Coal Hoists at Alexandra Dock, Hull, coated with "Rosphaltic"

In spite of the great amount of work carried out by scientists, owners of iron structures do not, as a whole, give that amount of consideration which is due to such an important matter. We cannot do better at this point than bring before our readers the disaster to the Charing Cross Railway Station where the massive structural ironwork roof collapsed with such terrible results. Upon investigation this was found to be entirely due to corrosion weakening the whole structure to its fall. Seeing this structure was under the cover of the glass and coated with paint the natural question is—Why should it corrode? The answers to this are: (1) Ordinary paint is not an efficient iron protective, for reasons which are discussed below; and (2) Iron is very slightly soluble in water; all iron and steels contain softer and harder portions, and electric currents are set up between these portions in the presence of moisture. Acid moisture increases the solubility of iron. The iron in solution, which passes with the current, is precipitated by the oxygen and carbonic acid in the atmosphere, thus forming rust. In the crossing and recrossing of bars, angles, etc., in structural iron-work there is great liability of potential differences being set up at points of contact.

This important subject has been uppermost in the minds of Messrs. Rudd & Owen for some years, and, as mentioned before a member of the firm, has given much time and thought to it. Careful experiments have proved that iron and steel rust very rapidly indeed when moisture and very minute traces of acid bodies are present. In the mists and rains which occur in all parts of the world traces of acids of various kinds always exist; thus rusting occurs the world over. Tiny electro currents, it was found, stimulate corrosion, and the increased use of electricity for lighting and motive power, always accompanied with what are termed "strag currents," render it necessary that immediate consideration be given to methods of protection of all structural work which may come under their influence.



25-ton Electric Crane painted with "Rosphaltic"

Attention was first paid to the so-called iron protectives which have been in use for a large number of years—the linseed oil paints. Chief amongst these are the red-oxide and the red-lead preparations. On carefully examining the medium, linseed oil, which produces the film and holds the pigment together, it was found that when dry it absorbed moisture from the atmosphere; the average amount absorbed according to many experiments was 4 per cent. Experiments proved that acid bodies, which act upon iron, were formed during the drying of the film and its subsequent exposure to the atmosphere. The pigments employed with the linseed oil, in the average number of cases, proved to be electro-negative to iron: all substances which are electro-negative to iron increase the rate of corrosion.

The results of these investigations clearly pointed out that oil paints, and in particular red-oxide and red-lead paints, are the very worst materials to use for iron protection. Practical experiments were carried out with oxide-oil paints, using preparations made up with materials containing no linseed oil or pigments for comparative purposes (controls). In all cases the oxide-oil paints broke down within nine months, much rust being evident, whilst the ontrols remained perfect up to periods of eighteen months, two years, and longer. These experiments proved conclusively that linseed oil pigment paints (red oxide and other kinds) are inferior as iron protectors.

Careful experiments were now carried out with the ingredients of which the best of the controls was made, and with other materials, with the object of making a first-class iron protective solution, possessing great flexibility and lasting power, resistance to the passage of electric currents and moisture, freedom from deposit, high flash point and great covering power. Care was taken also that the materials used should not act upon metal, and should be capable of resisting chemical fumes, salt water, etc.

The result of many expensive experiments was Rosphaltic solution, which requires no stirring and possesses all the properties just mentioned, making it the best and at the same time the cheapest iron protective on the market. The important fact that one hundredweight of Rosphaltic solution covers 4,500 square feet of metal surface with two coats, which is three times the area covered by the best oil paints, and very nearly twice the area covered by other preparations, should not be lost sight of. Also its high flash point reduces very considerably the risk of fire.

The vast importance of the result of Messrs. Rudd & Owen's researches was so manifest to them that they immediately took the precaution of registering the name of "Rosphaltic" for their solution. The title is derived from R. & O.'s asphaltic solution. They have also designed the label which is now used on all barrels, in advertisements, etc., in order that purchasers can become quite familiarised with its form and know that they are getting the genuine solution. All the firm's barrels show their monogram which is also found on packages containing other manufactures of Messrs. Rudd & Owen.

Rudd & Owen are also manufacturers of Rosco Galvanizing Paint (Pure Aluminium) for decorative purposes., Blofil Iron Cement for stopping leaks, repairing castings, filling blow holes, etc., Stoving Blacks, Decorative Art Blacks Rosco Damp Resister for arresting damp in walls, Roscophalt coloured Bituminous Paints, Fillings for Iron, etc., etc.

An interesting booklet showing examples of ironwork treated with Rosphaltic and giving much desirable information will be gladly sent to any readers applying direct to Messrs. Rudd & Owen, Hull. We reproduce views of some of the numerous iron structures which have been protected by Rosphaltic solution.

Roof of Important Stations in Hull and Barnsley Railway Painted with "Rosphaltic"

Sports Club, Johannesburg, all Ironwork treated with "Rosphaltic"

SALT INDUSTRY IN KOREA

The *Osaka Mainichi* notes that the industry of salt refining at Chemulpo was counted among one of the most promising enterprises in Korea. At one time there were 31 salt refineries in Chemulpo, and the annual value of the salt produced there was estimated at between Y.700,000 and Y.800,000. The industry is one that can be conducted with a comparatively small capital, but even the Mitsui Bussan Kaisha directed attention to the industry, and refineries cropped up at Kunsan and other places. The anticipated success of these enterprises, however, has not been attained, although the process of refining salt in Korea is very simple. Crude salt is brought over from China by junk, and is dissolved in salt-water and then boiled. The salt so refined is whiter than the salt refined in Japan, and at first there was a large demand for the salt refined in Korea, but the quality is very poor. The Koreans found it unfit for use, and now the Chinese salt thus refined is used only in small quantities mixed with Korean salt. It has been found quite unsuitable for preserving fish, the brine being very poor. Of the 31 salt refining factories at Chemulpo, only one or two are still continuing operations, and there is no prospect of the recovery of the industry.

THE PUKOW SETTLEMENT

Mr. B. G. Tours, British Consul in Nanking, in his report on the trade of that port for 1912 says: No visible progress has been made in the matter of the development of the Pukow settlement at the southern terminus of the Tientsin-Pukow Railway, on the north bank of the Yangtze river, opposite Nanking. Much has been lost by the want of foresight of those responsible in not having had a settlement scheme ready to be put in hand as soon as the railway was sufficiently near completion. After the railway was completed a special commissioner was appointed to undertake the work of arranging for the establishment of a settlement at Pukow. He unfortunately died, and a successor was appointed; this gentleman commenced his work by proceeding to Tsingtao and Tsinan to study the settlements in those places, it being the idea of the Chinese authorities to make the Pukow settlement an example to the world of what China can now do in this direction, with her own brains and hands, and with her own money when she has any. The ambition is worthy enough, but preliminary difficulties of erecting a suitable and adequate settlement on ground which is 12ft. or more under water at the time of summer high water, and of financing the necessary municipal buildings, wharves, lighting, water supply, godowns, etc., are not inconsiderable. The special commissioner is doing his best with the avalanches of advice which pour upon him, but it will be some time before any scheme is properly in train, and some years—probably five or six—before the settlement is in practicable shape.

In order to protect the valuable records of the U. S. Government from danger by fire Congress has made an appropriation for the installation of a modern system of auxiliary fire protection for three of the largest buildings occupied by the Department of the Interior in the city of Washington. A committee has been appointed to investigate the relative merits of systems adaptable to the buildings of the Department and to prepare plans and specifications. All communications regarding the subject should be addressed to the Chief Clerk of the Interior Department, Washington, D. C.

The Engineer hears that a steam turbine of 40,000 horse-power will be erected in the Hagen electric power station, Westphalia, Germany. This is said to be the largest turbine unit yet built. The present largest units are the two 30,000 horse-power turbines of the Rhine Westphalia Company, Düsseldorf, which were erected during 1912.

THE RELATION OF ELECTRICAL ENGINEERING TO OTHER PROFESSIONS.*

By Gano Dunn

On the wall of a great engineering library is the legend "Engineering is the ar of organizing and directing men, and oft controlling the forces and materials of Na;ture for the benefit of the human race." Th s is broad and all-embracing, but other professions will find it hard successfully to quarrel with it. While the imme diate object of engineering is a mateŗal one engineers draw from many different channels of human energy, such as generalship, commerce, psychology, mechanics, economics, to say nothing of chemistry and physics and many others, all under an interpretation, insight and method that are best described by the term scientific.

It may be asked: Why could not a similar statement of embrasure or scope apply to medicine, the law, the army and other professions? In part it could, but it is to engineering that it applies preeminently. The subject matter of the older professions, the things about which they busy themselves, and the objects they seek to accomplish have changed relatively little in many centuries. The means have altered but the ends persist. They are approximately the same to-day as they have been throughout history and tradition. With engineering it is different. There was no such profession a hundred and fifty years ago, and if I may a little anticipate my conclusion, there will be no such profession a hundred and fifty years hence in respect to a large part of what we now call engineering.

Such as it is, engineering is embracing an evergrowing horizon, and is including more and more of the activities of civilization. When I say activities I refer to material ones and not to the whole of life itself. The human spirit is the greatest fact in the world, and art and lite rature that interpret it, the acts of our daily life and our personal relations that depend upon it, religion and the vast body of our social and political experience, that go to constitute life form undoubtedly a mass of activities, which are greater, in terms of consciousness, than the material activities which engineering can affect. In other words, the humanities which have been the same for ages can never be invaded by anything that merely rearranges our relations to the material world.

In the material world, however, which is at once the workshop and the throne, the glory and the limitation of the engineer, marvel has followed marvel and shall be followed by more marvels, for we are beginning to catch the tools' true play; beginning to see the vision of our dominion over the earth. Whether it really is engineering to organize men, to predict the psychology of a fare-paying population, to win the endorsement of a labor union, to treble the yield of a farm by a microscope, all of which successes are called engineering, depends upon the definition that we finally adopt.

It is startling to study the variety and importance of the posts filled by engineers and to note the range of what they do. From the Efficiency Engineer presenting surprises in the output of a factory where the human factor is large, or the Industrial Engineer suddenly after thousands of years showing the world how to increase greatly the lay of bricks, or the Agricultural Engineer working miracles with the soil that for ages farmers have struggled with, to the Civil Engineer establishing a kingdom and building the Panama Canal, we have instances in which the engineer is doing more and more of the world's work.

The history of this class of men so rapidly growing in numbers, so rapidly differentiating in function is almost a romance. The Encyclopedia Brittanica names the middle of the eighteenth century—that is, 1750—as the time before which there were only Military Engineers—who constructed "engines" of war—and it adds that at about that time there began to arise a new class. Little did this new class realize the army it was leading down the industrial paths of time!

The "new class" has surpassed all bounds. From insignificance a hundred and fifty years ago it has increased almost incredibly in numbers and variety of specialization. As a local indication, the Engineering Societies' Building in New York is the headquarters of fifty thousand engineers. As another local indication, the American Institute of Electrical Engineers has in the last ten years increased six fold. The growth in the variety of specialization has been almost as rapid as the increase in numbers. Where there were only Military Engineers and the "new class" a hundred and fifty years ago, there are twenty-seven recognized varieties to-day. Without mentioning all, they range from Civil through Mechanical, Electrical, Mining, Illuminating and Chemical, to Metallurgical, Refrigerating, Industrial, Agricultural and Aeronautical. There is even a magazine with the title Human Engineering.

A large and increasing part of the capacity of our Colleges and Universities is devoted to the education of engineers. Parts of the engineering curricula are borrowed for what used to be purely classical courses. The metaphors of the speech of the day often have an engineering basis and—we have a McAndrews hymn. The man in the street knows something about spark plugs, and many women understand the general principles of the telephone. The social status of the engineer has emerged from that of a mechanic to one nearly as high as that of the clergyman, the physician or the lawyer.

Relatively recently there has been going on simultaneously with all this, however, hardly noticed, something else—a vast increase in so-called engineering work by men who are not engineers, and at the same time a large drawing off into executive, administrative, industrial, commercial, civic, educational, financial and even legal callings, of men of engineering training. A history of segregation and disintegration seems to have begun to accompany a history of integration and building up.

For one to say to-day he is an engineer gives very little idea of what he actually does. It does not locate him in one of the twenty-seven recognized classes. It leaves it possible for the hearer to think of him as a "social engineer" or an "efficiency engineer" should he not look like a "civil engineer," but even if he did define himself and say he was an electrical engineer, the hearer would still not know whether he represented the last word on the loading of telephone circuits or his responsibility was to determine whether the great railroad terminals of Chicago should use a third rail or an overhead catenary. If he should say "I am a teacher," "a physician," "a clergyman," "a lawyer," there would be a much more definite conception attaching to his answer. There must be, therefore, in the title "engineer" something broader, something not included, or included to a lesser degree, in the titles of the other professions or occupations.

A light is shed if we examine the popular definition that engineering is "educated common sense." Can it be that unlike "physician," "lawyer," "teacher," the term "engineer" does not describe what a man *does*, but rather *how* he does it! A method rather than an occupation! It is even so; that is essentially and with limitations I shall refer to later.

What then is this "method" that has given the engineer his ever broadening domain and brought all kinds of men and callings to his school? He can tell you at once. Here is where he is defined and where his fellows recognize him and each other though they come from the ends of the industrial earth as to diversity of actual occupation. The method had its birth in Greece, though it was stifled almost to death by the tremendous philosophic, humanistic and artistic energies of the Hellenes. Later it was buried in Europe under the irruption of the barbarians. The names of Thales, dear to our profession, with his "elektron," and of Aristotle and Archimedes, stand out as having done much for it—especially Archimedes in dspite of the humanistically polarized

*An address presented at the 29th Annual Convention of the American Institute of Electrical Engineers, Boston, Mass.

intellectual atmosphere in which they lived and which they contributed so gloriously to create.

But the Greeks made only a start. To quote an authority, their material thinking was largely based on what has proved to be a wrong method of procedure, the introspective and conjectural rather than the inductive and experimental. They investigated Nature by studying their own minds, by considering the meanings of words rather than by studying things and recording phenomena. But they saw much of the light with all this. Though absolutely dead for a thousand years in Europe, "the method" was kept alive during the middle ages in Arabia, although confused with magic, alchemy and algebra. Then came Roger Bacon, Leonardo da Vinci and Copernicus, and science as we know it began to take shape.

Aristotle had sat down in his chamber and he wrote in a book, "A body twice as heavy as another of course falls twice as fast."

Galileo released simultaneously from the top of the Leaning Tower a one pound and a one hundred-pound shot and they reached the earth together, before the eyes of the assembled University of Pisa. But "the method" was repugnant to the University, and almost to a man they believed their Aristotle, sophistically explained away what they saw, and persecuted Galileo. Descartes, Newton, Lagrange, Laplace, Francis Bacon connote to engineers the transcendent story, unless for electrical engineers there should be added Ampere, Faraday, Henry, Helmholtz, Kelvin.

The method of doing things that makes an engineer is, therefore, the applying to practical and utilitarian ends the principles and reasoning of science. Engineering is not science, for in science there is no place for the conception of utility. Truth is her sole criterion. In the exalted language of Professor Keyser, "Not in the ground of need, not in bent and painful toil but in the deep-centered play-instinct of the world Science has her origin and root; and her spirit, which is the spirit of genius in moments of elevation, is but a sublimated form of play, the austere and lofty analogue of the kitten playing with the entangled skein or of the eaglet sporting with the mountain winds."

Engineering is Science's handmaid following after her in honor and affection, but doing the practical chores of life, concerned with the useful and the material; with costs and with expediency and concerned with the humanities only in so far as they are an incident in some particular scheme of reality, and then objectively, if that may be said. Her methods merely apply "straight thinking to material problems for useful purposes."

Does this constitute a profession? No. Some day it will be the way almost everybody thinks instead of a body of specialists and then the difference between the doctor for instance and an engineer will be only in the things they busy themselves about; as is to-day the only difference between kinds of engineers. The center of education has been shifting rapidly recently—almost as rapidly as material well being has been increasing. The application of science to living has marked an age as distinct as the age of the climax of Art in Greece. The "new class" has been but a pioneer in sowing the seeds of scientific rationalization in a field the value of which was only dreamed of by Archimedes and not actually recognized until, as the Encyclopedia tells us, "about the middle of the eighteenth century," when the "new class" began to arise. And now, as to the limits which Engineering is a method rather than an occupation.

There will always be engineers, for the methods of Science will constantly advance, and there will be needed continually to interpret and transmit them to mankind and to make the first applications of them to useful purposes, a class of men who, by instinct and taste, as well as by the possession of what I later shall call the dynamic component, find easier than other men—and consequently perform better—the kind of scientific thinking, observation and action that characterize engineers to-day.

What these men will be busy about it is hardly safe to say, although it is probable the present great divisions of engineering will be more or less preserved. It seems certain that a large mass of knowledge that now is called engineering and forms the basis of many of the engineering specializations, will become general knowledge, and will be absorbed by the community, partly as a result of the shifting of the center of education and partly through everyday familiarity, and the men possessing this knowledge will no longer be called engineers. They will be called farmers, let us say, in the case of the "Agricultural Engineer"—of course, a farmer of a very advanced kind compared to the earlier one.

But the center of education will not always continue to shift. It is shifting now only because it has so long been eccentric. It would be a calamity for it to shift too far, resulting in a world whose sole training was applied science and the utilities. Under such a condition, engineering and the utilities themselves would languish instead of flourishing, for there would be lacking in engineers the dynamic component.

Ample knowledge, insight, information does not make an engineer. He must first be a man. Engineering is not throught like philosophy; it is thought times action, and only when the qualities of action are developed approximately to the same extent as the qualities of thought is an engineer at his best. Only then is his area of effect a maximum. The qualities of action involve tastes and personality, the feelings, the will. And it is these that constitute the component or factor that makes an engineer's intellectual or rationalizing equipment dynamic—that puts it to use.

It was partly the intense appreciation of the value of the dynamic component that led the Greeks and successive centuries astray in the direction of their education and contributed to an underestimate of the importance of Science and the study of the laws of Nature. We must not go to the equally wrong other extreme.

So far I have said but little of electrical engineering. It must be brought in if for no other purpose than to justify our title. Although the article on "Engineering" in the Brittanica occupies only six inches of one column, it concludes with the following: "The last great new branch is *electrical* engineering, which touches the older branches at so many points that it has been said that all engineers must be electricians." If engineering is a method of doing things, and electrical engineering tends to embrace all other branches, there is an implication that electrical engineering is the latest or most highly developed form of the method—the method that is the utilitarian application of the principles of Science to the material facts of life.

Such is unquestionably the case. Born scarcely more than twenty-five years ago, the "youngest branch," Electrical Engineering had the opportunity of striking its roots into the richest of scientific soils, free from prejudices, customs or traditions. It had no entangling alliances, no political laws to retard or encumber it. The field it preempted was the Terra Nova of Engineering, the New World of Applied Science.

Under the influenee of those geniuses of science, Volta, Faraday, Ampere, Ohm, Kelvin, Helmholtz, Maxwell, Oersted, Henry, Gauss, and with the metric system for its cornerstone, there developed a comprehensive structure of thought and a related scheme of units. The latter are the admiration of the world for their simplicity, their convenience, their precision and their reproducibility. The scientific method as applying to all phenomena acquired its most perfect embodiment in the electric system and its relations.

But there is a philosophic debt that we electrical engineers owe our units. They school our minds. The ability to measure with precision difficult and complicated quantities enables clear thinking on them and renders reasoning about them possible that otherwise could not be attempted. To name a thing is to know it. The wonderful electrical units are a fluent language that gives the widest opportu-

(*Continued on page 110.*)

THE SUGAR INDUSTRY IN THE PHILIPPINE ISLANDS

By C. M. Conner, *Chief, Division of Agronomy.*

Origin

It is not known just when sugar cane constituted one of the cultivated crops of the people living along the coast of South China or the Malay Peninsula, from whence it was undoubtedly introduced into the Philippine Islands. There is little doubt, however, but that it was first made use of in India, perhaps along the Ganges. As it is not now found in the wild state in any country it is impossible to even guess its original home. There are several grasses growing in the Philippine Islands and in tropical India that are closely related to the sugar cane, but variations in soil, temperature and rainfall cause such wonderful and comparatively rapid changes in all plants in the Tropics that it is impossible to say what a certain plant was like a few thousand years ago. The people who did first make use of it, perhaps found it growing wild in the jungle where it served as food for such animals as wild swine, elephants and other herbivorous animals. That swine fed upon it to a considerable extent would seem very plausible, and in rooting up the mature plants, the younger ones which escaped destruction were cultivated, as it were, and the field was left in good shape for another crop.

First Use

Undoubtedly the cane was first used in chewing the stalk for the juice. Even at this time one will find sugar cane peeled and cut in small blocks and served at meals in Siam and parts of India. The juice was also extracted by crude methods and used as a fermented drink. Some one finally discovered that by boiling the juice it would become sweeter and would not ferment so rapidly. Geerligs says that fellow-travelers of Alexander the Great mention in their notes a reed growing in India which produced "honey" without bees. This "honey" was perhaps a thickened syrup made by boiling the juice until it made a thick sugary molass, called "gur" in India. Such syrup has been used by the natives in India since prehistoric times and is known in Sanskrit as "gud," which indicates a very ancient origin.

In order to make sugar it was only necessary for some one to accidentally boil down some of the juice to the point at which it would crystalize. This occurred about the seventh century in India.

Sugar-cane culture had reached the shores of the Mediterranean early in the Christian Era, and the Egyptians were among the first to make a kind of pure sugar by re-crystalizing. This did not happen, however, until several hundred years after the discovery of sugar.

Introduction into the Philippines

The cultivation of sugar cane and the art of making sugar were undoubtedly introduced into the Philippines Islands by the Chinese. A description of the machinery and early methods used along the coast of China and Formosa reads very much like a description of early methods used in these Islands. Magellan, in 1521, found the sugar industry already established, although on a very small scale.

It is known that sugar making was first carried on in the Provinces of Pampanga and Batangas. The main reason why the industry flourished in these provinces only, in the early days, was that it was not safe to go into other sections with any large amount of property and as it requires a rather expensive equipment to grow and make sugar, the growers did not care to take the risk. However, as conditions improved, the industry began to spread to various other islands.

Sugar Soils

In these Islands there is no "typical" sugar soil. Sugar cane is grown on every kind of soil from light sand to heavy clay, the essential conditions being sufficient natural fertility, good drainage, and a retentive subsoil.

Much of the sugar cane in Pampanga is grown on a light sandy soil of rather low natural fertility. In Laguna and Batangas, the sugar soils are composed of a black, heavy, very retentive clay, except in the neighbourhood of Taal volcano, where more or less volcanic ash is mixed with the soil, making it rather light and easy to work as compared with the heavier soils near Lake Laguna. The majority of the soils are of rather high natural fertility. These black, sticky soils around Laguna grow very good cane. The Hawaiian varieties of cane grown at Alabang, Rizal, which is on Lake Laguna, seemed to make as vigorous a growth as did the same varieties at La Carlota, Occidental Negros; no fertilizers were used at either place. The sugar mill at Muntinlupa, mentioned elsewhere, makes sugar from cane grown on this type of soil.

In Occidental Negros most of the sugar soils are of volcanic origin and are of rather high natural fertility. Here and there are found many fertile spots which shade out to poor unproductive soils; there are large areas, however, which compare favorably with any of the sugar soils of the world. The average yield of sugar per hectare for the Province of Occidental Negros, as shown by statistics collected by the Bureau of Agriculture, is 2,295 kilos. This average is lowered by the great number of fields poorly managed and fields of low fertility planted to cane. Walker says: "I may state from personal observation that on a well managed plantation—and there are a few such in Negros—the yield per hectare under normal conditions of land actually planted in cane will rarely fall below 60 piculs (3.8 metric tons), and frequently comes nearer 70 piculs (4.4 metric tons); this should hold true in the poorer as well as the richer sections, as the difference in quality of soil is in a measure made up for by the fact that cane grown in the former is as a rule richer in sucrose and is replanted every year on fresh soil, whereas in the latter it is allowed to ratoon until the yield becomes greatly diminished."

Commercial Fertilizers

Commercial fertilizers are not used to any extent on sugar cane as yet in these Islands, but as more large mills are established and more intelligent methods of culture are put into practice, commercial fertilizers will find their proper place in cane culture. In most of the older cane-growing sections some sort of rotation is followed. In Pampanga and Tarlac other crops such as rice and corn are planted on the land after the cane crop. In Negros it is the custom to allow the fields to lie idle for one year after the last ratoon crop is taken off and pasture the work stock on this land during the season. Both of these methods have their faults. While in the first they secure some returns from the lands, such returns are not as great as they would have been had the land been in cane; neither was the soil improved for the next crop of cane. In Negros nothing is gained in the way of a crop except pasture for the work stock, but the land is slightly improved on account of the increase in humus or organic matter left in the soil by the crop of grass. It would be infinitely better if the fields were planted in cowpeas or velvet beans and the crop either harvested for hay or pastured off with cattle. In either case nitrogen should be added to the soil to produce two or three good crops of sugar cane.

In making use of commercial fertilizers, it will be necessary to make a study of the soil. Different haciendas may require fertilizers of different compositions and much experimenting will be necessary before a formula is decided upon for any one locality.

Fertilizers do not improve the quality of sugar, as many people believe, but on the contrary tend to produce a juice having more impurities than that from cane grown on poor soil. This fact, however, need not discourage the use of fertilizers as these impurities are easily removed by the modern mill. It should be borne in mind, however, that unless there is a uniform supply of water for the crop, either by rainfall or irrigation, much of the expected increase from the use of fertilizers will be lost.

Varieties

New varieties of sugar cane are not easily produced, hence the number of varieties found in these Islands, prior to the organization of the Bureau of Agriculture, was very limited.

New varieties are produced in two ways, first by growing your seedlings, which by the way is very difficult, and by bud-sports from some established variety. Many new varieties have been tested out during the last twenty years, but only a few have met the requirements of the planters.

Walker says that "The native cane ordinarily grown in Negros is, in respect to the richness and purity of its juice, equal to that of almost any other sugar-producing country in the world, and, having in addition a comparatively low fiber content, could hardly be improved upon in its adaptability to a thorough and economical extraction by milling." Some new varieties introduced from Hawaii, in 1910, were grown at Alabang, Rizal Province, and La Carlota, Occidental Negros. A test was made of these by the Bureau of Science, and the results are given below together with the variety mentioned by Walker (referred to above) which is shown in the last line, second section of the table.

Analysis of varieties of sugar cane.

Names of varieties.	Juice. *Per ct.*	Polarization. *Per ct.*	Brix.	Purity of coefficient.
H-16	75.8	14.3	16.3	87.8
H-20	90.3	18.3	19.3	94.9
H-27	77.3	17.0	17.9	95.0
H-69	81.8	12.9	15.0	86.0
H-227	78.3	14.1	15.9	88.8
H-309	93.2	14.9	17.1	87.6
Native cane	78.8	19.9	20.7	96.5
Negros cane	89.9	18.4	20.3	90.3

Hawaiian varieties of sugar cane grown at Alabang.

Harvested December 20, 1911.

The six Hawaiian varieties mentioned above were planted at Alabang in December, 1910. On December 10, 1911, another field was planted to these same varieties. On November 11, 1912, both these fields were in full arrow. There seems to be something in the climate which makes these varieties mature much earlier than they do in Hawaii.

The larger growing varieties, common to Hawaii and other cane-growing countries, have not met with popular favor among the small planters, first for the reason that the stalks were too big for small mills to handle and second because the larger varieties would not respond properly under the native methods of handling. The native cane is planted in rows varying from one-half meter to 1 meter apart, depending upon the locality. Cane so planted soon covers the ground and checks the growth of weeds and grass but does not produce the greatest amount of sugar per hectare. It is true that the smaller native varieties may be planted closer than the larger foreign varieties, but the general tendency heretofore has been to plant too close. Some of the more progressive farmers in Laguna and Pampanga are planting the native cane in rows 1 meter to 1½ meters apart; for the larger foreign varieties, the distance is increased 50 per cent.

On the San José Estate at Mangarin, Mindoro, where 5,000 hectares of new land are being planted to cane, the native varieties are plant

in rows 1¼ to 1¾ meters apart and the tendency has been to increase rather than to decrease the distance.

It should be understood that these distances are possible only where the cane is given the best possible culture and attention.

The division of agronomy of the Bureau of Agriculture has the following varieties of sugar cane under observation:

Common Negros purple.
Inalmon, Negros dark purple.
Yellow Caledonia.
Rose bamboo.
Striped Louisiana.
Lahaina.
H-16.
H-20.
H-27.
H-227.
H-309.

A limited number of stalks of these, for seed purposes, may be had free of charge. Large quantities, when available, will be sold at the rate of P.10 per ton, parties desiring the cane to pay cost of cutting and of transportation to shipping point.

EXTRACTION OF JUICE

The juice of sugar cane was first extracted by pounding short pieces of cane in a mortar. A small outlet was left at the bottom and the juice allowed to run out into a jar.

The first mills consisted of two wooden rollers set in an upright position and turned by animal power. This was followed by stone rollers cut out of granite at a very great cost of time and patience. The steel rollers are of rather modern origin.

Naturally a large per cent. of the actual sugar was lost on account of faulty methods of extracting the juice, and only a low grade of sugar was made owing to the methods followed in boiling. These ancient methods, with only slight improvements, have continued down nearly to this date. A new era, however, is dawning for the sugar industry, as modern mills are being installed and sugar of the highest quality is being produced.

CENTRALS

At the present time there is one large central in operation. This mill has 11 rollers and is capable of grinding 1,200 tons of cane in twenty-four hours. It is located at Mangarin, Mindoro, and is owned by the Mindoro Company. Two mills of like character will be ready to begin operations in the near future. One, owned by the Calamba Estate near Calamba, Laguna, will be ready to begin operations in 1914, and another, at San Carlos, Occidental Negros, owned by the San Carlos Milling Company, will be ready to begin operations in 1915.

There are also in operation three smaller mills, with a capacity of 125 tons of cane in twenty-four hours, located in various parts of the Islands. One, owned by Macondray & Company, is at Muntinlupa, Rizal Province; another, owned by the Roxas Estate, is located near Nasugbu, Batangas, and the other, owned by S. Urquijo, is near La Carlota, Occidental Negros.

Several other small mills are in project.

As soon as these mills get well underway and the people see that there is more money in selling the cane to the large mills than there is in manufacturing a low grade of sugar, other mills will go up as fast as money can be found to finance them.

ACCORDING to the American Consul-General at Moscow, the production of copper in Russia has greatly increased in the last few years. In 1906 the production was 10,000 tons, and was not equal to one-half the requirements of the country. This increased to about 30,000 tons in 1912. At present all domestic requirements of electrolytic copper are met with metal of Russian origin.

THE RELATION OF ELECTRICAL ENGINEERING TO OTHER PROFESSIONS.

(*Continued from page 108*)

nity to thought. By their character they educate our faculties of definition and of relation. They typify all quantitative thinking, not merely electrical. They are, indeed, the epitome, the last word of the great minds of our age, as to what the scientific method of thought is.

Therefore although the subject matter of electrical engineering is covering a wider and wider range—so wide as to be almost incongruous, the electrical method of thinking is applicable throughout it and it is, in fact, spreading far beyond. As an electrical engineer, I even find myself thinking of the crowds passing in the streets in terms of amperes and volts, and of the fluctuations of the stock market in terms of current, inductance, capacity, resistance and resonance.

That which can impose form upon our thought enables us successfully to think of any kind of thing. The forms of thought established for electrical engineering are at once so comprehensive, so rigid, so rich in detail, and so illuminating that engineering does not bound them. They may be called the manifestation of Science in civilization, the best representation of the scientific method at work for utilitarian ends. They prove that the profession of Electrical Engineering not only deals with single-phase motors, storage batteries, high-tension transmissions, turbo generators, coronas, carbon transmitters and commutation, as an occupation, but that it also is a way of thinking, and as such is not an occupation, but the latest and most highly developed scientific method of solving all kinds of practical problems of matter and force, for the benefit of the human race.

IMPERIAL JAPANESE IRON FOUNDRY.

The *Jiji* quotes General Nakamura, Director of the Imperial Iron Foundry, Japan, as follows on the working of the foundry:—The foundry is now in course of extension. In carrying out the administrative reforms just effected, part of this work of extension has been carried forward, the staff has been reduced, and expenditure curtailed, but not in a way to interfere with the operation of the concern. As a result of the first stage of the extension of the foundry, made in 1909, new machinery was added. Over 160,000 tons of iron and steel were produced in 1910, over 180,000 tons in 1911, and 250,000 tons last year. It therefore follows that the net profit of the foundry has also increased. The profit amounted to Y.50,000 for 1911, increased to over Y.150,000 for last year, and is estimated to increase to Y.4,000,000 this year. This increased profit is partly due to the activity of the iron market at home and abroad, and partly to the improved skill of the operatives and the perfection of the machinery and plant. The output of iron and steel this year cannot be ascertained as yet, but is estimated at no less than 200,000 tons, so the net profit is estimated at about Y.4,000,000.

AUTOMOBILE TRAFFIC BETWEEN KULUN AND KIAKTA

The following is from the *China Tribune* (Tientsin):—At a conference recently held at Moscow to discuss the question of operating automobiles between Russia and Mongolia, the report of an investigating committee consisting of Mr. Ressenikoff, Chairman of the Trade Association Dr. Popofe, Mr. Gorkin, a wealthy merchant of Kiakta, Engineer, etc., was read concerning the plan to open automobile traffic between Manchouli and Kulun. The scheme was based on the result of investigation made by the Russian Frontier Garrison. The distance measured 800 versts of nearly level ground, except a section of sandy soil for over fifty versts. More than twenty days are required for a camel or cattle to cover it, but only two days will be required by an automobile. The report pointed out the advantage of attracting railway traffic if the route is opened, while establishing Russian influence in the region rich in natural resources and having important military relations.

The plan, however, was opposed by many. The reason briefly stated amounted to this. By the Manchouli-Lulun Route, Russian merchandise will be sent eastward first and then turned back to the western direction. The detour making the distance unnecessarily great, Russia will receive no benefit. Besides, they did not desire to have Manchouli, that is remaining as the source of many disputes between China and Russia owing to its proximity to China's border, as the starting point of the route. The meeting finally approved a proposition to run automobiles between Kulun, Kiakta and Welfnevjinsk, so that connection with the Siberian Railway can be established.

The passage selected by the Conference being in a fairly good condition, there are persons who are even now individually running automobiles on it. The distance between Kulun and Kiakta measures 250 versts and that between Kiakta and Welfnevjinsk is something lik 550 versts. Since Russian goods exported to Mongolia by the Siberian line are shipped under special reduced rate as far as Welfnevjinsk Station, which was carried in effect on May 1st, the proposed scheme, when put in operation, will prove to be very advantageous toward developing the Russo-Mongolian trade. The meeting is said to have submitted the plan to the Russian authorities, the Mongolian Government and local merchants.

PUBLIC WORKS AT ZAMBOANGA

During the present year, says the *Manila Times*, the thriving city of Zamboanga will spend the sum of P.400,000 for needed public improvements, an arrangement having been completed with the insular government for a loan of P.320,000 of the amount, and P.80,000 being appropriated by municipal and provincial governments.

The greater part of this sum will go into port works, for which plans are now being perfected by the port works division of the bureau of navigation, under the supervision of Assistant director Heck and Provincial engineer Stirling, who is now in the city with plans prepared by him independently of the bureau. As the construction and designing of the port works comes under the supervision of the bureau, his plans are being rearranged to meet the approval of Director Helm.

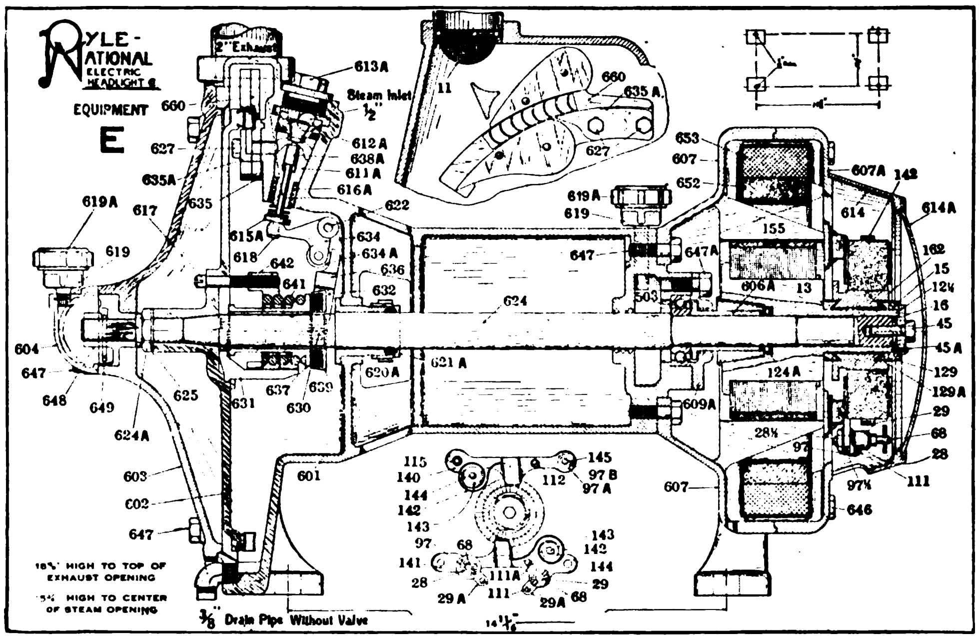
Plans and specifications for the waterworks plant, also included in the P.400,000 expenditure, were completed some time ago, and the province is now advertising for bids for its construction. The city is at present inadequately supplied with pure water, and plans have been on foot for years to replace the antiquated system now in use with a modern plant.

As soon as completed, bids will be requested for the port works construction.

THE PYLE-NATIONAL LOCOMOTIVE HEADLIGHT

The Pyle-National Locomotive Turbine Generator and Electric Headlight Equipment, shown here, is the developement of eighteen years' exhaustive experimenting by the most capable talent and the best equipped factory for the manufacture of Electric Headlight Equipment in the United States, consequently enabling them to insure the highest class workmanship and absolute uniformity and interchangeability of parts.

The turbine is of most simple construction and is composed of but few parts which are extremely strong. The casing is constructed of one casting and has a barrel extension for connecting to the generator and also for supporting the generator bearing, assuring perfect alignment and easy running. There are two steam inlets which are situated near the top of the casing and at opposite sides of the valve chamber so that the steam may be piped to the turbine as is most convenient and with the shortest possible pipe. The steam ports are made short and of small area, thus reducing the condensation to a minimum and are so designed that all water drains through the turbine, making it impossible to freeze and burst. The exhaust opening, which is of 2" pipe diameter, is at the top and at the left side of the casing and in alignment with the buckets, providing a free unobstructed passage of the steam to the atmosphere. A drain pipe is provided to carry off any water of condensation.

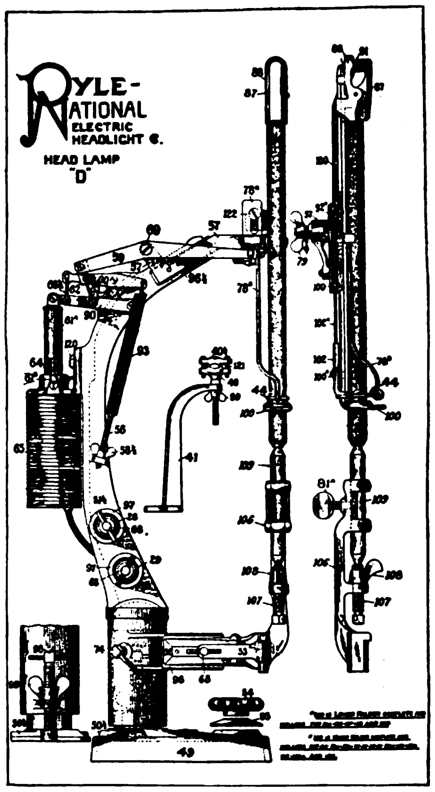


The rotor or wheel is made of cast steel and perfectly balanced and is held on the shaft by means of a taper fit and a lock nut which bears against the hub. The wheel contains but one row of buckets which are made from a drawn sheet metal. The buckets are dove-tailed into the side of the rotor and welded substantially together, making the completed rotor as strong as though the buckets and rotor were integral.

The buckets are formed symmetrically with round corners to accelerate the flow of steam. They are designed to travel at a velocity of 185 feet per second. The steam is delivered to the buckets three times, first from an initial expanding nozzle which increases the velocity of the steam from approximately 1,450 feet per second, at which velocity it enters the nozzle throat to nearly 3,000 feet per second, at which velocity it is delivered to the buckets from their inner side in an outward radial direction. After passing through the buckets it is taken up by a guide passage and again delivered to the buckets from the outer side in an inward radial direction. After passing through the buckets the steam is again taken up by another guide passage and is delivered to the buckets in an outward radial direction. Each time that the steam passes through the buckets, a certain amount of velocity is abstracted so that the velocity is greatly reduced after its third passage, after which it passes directly to the exhaust opening.

By having the nozzle and second guide passage situated at the top and on the inside of the row of buckets, the steam aids in the suspension of the rotating parts, thereby reducing the friction and wear on bearings and shaft to a minimum.

The governor is of an improved centrifugal type, having a tension coil spring, which is screwed into a yoke. This in turn is held to the rotor by two adjusting screws. The opposite end is fastened to a sleeve secured into it. This sleeve is made from a close grained cast iron, into which is fitted a brass bushing. The purpose of this bushing is to avoid corrosion and sticking of the sleeve to the shaft upon which it slides. At one end of the sleeve there is a flange, having a smooth surface against which a composition ring bears and transmits the reciprocating motion from the rotating sleeve to a yoke lever mounted in the casing. The yoke lever in turn imparts the motion to an intermediate lever which rests against the adjusting nut on the valve stem, thus automatically adjusting the valve to the load or steam pressure and maintaining a fixed speed.



The Governor weights are of "L" form made from drop forgings and rock upon knife edges in sockets on the rotor. The shorter leg of the weight is forked to straddle the shaft and rests against the end of the governor sleeve, the whole making a very sensitive governing mechanism, which controls the rotative speed within 3%. The governor valve is of simple conical poppet type, mounted in a taper cage, having ports which register with corresponding ports in the turbine casing. The valve controls the flow of steam to the nozzle by throttling, the motion being imparted to the valve from the governor. A retaining nut forming the valve seat holds the valve cage in place. For adjustment of the valve to compensate for any wear that has taken place, the valve cage is withdrawn from the casing. This is done by removing a screw cap which closes the opening for receiving the valve cage, unscrewing the retaining nut valve seat and inserting a 5/8" machine bolt in the threaded upper end of valve cage and withdrawing valve cage and valve. The adjustment is then made by the adjusting nuts on the valve stem, screwing these to the left shortens the valve travel and takes up any wear that may have taken place.

The shaft is made from a very high carbon steel and ground absolutely true, supported by a composition sleeve bearing, mounted in the turbine cover with oil cellar and ring. The generator end is supported by a ball bearing which does not allow the armature to come in contact with the pole pieces from wear.

The generator is of the bi-polar, internal magnetized type. The pole pieces are integral with casing, The field windings are compound. The shunt and series coils are insulated separately and taped together. The windings are generously proportioned and will carry momentarily 100% overload without injury.

The armature is of the slotted ring type.

The brushes are held in contact with the commutator by a spiral spring with a fixed tension, requiring no adjustment. The generator for locomotive use is wound for 32 volts and will develop 1,500 watts at its maximum speed of 2,800 R. P. M.

CANADIAN PACIFIC RAILWAY

A telegram from the secretary of the Canadian Pacific Railway Company at Montreal states that the gross earnings from railway and steamship lines for the year ended June 30 amounted to $139,395,699, against $123,319,541, while the working expenses absorbed $93,149,825, aginst $80,021,298, making the net earnings $46,245,874, against $43,295,243. To this has to be added net earnings of steamships in excess of the amount included in the monthly reports ($1,245,563), making a total net income of $47,491,437, against $44,402,692. After deducting fixed charges there is a surplus of $30,615,085, against $33,877,754. The sum of $1,000,000 is again transferred to steamship replacement account, and $125,000 is again contributed to the pension fund, the net revenue from railway and steamship lines available for dividends being $35,490,085, against $32,752,754. After payment of all dividends declared for the year the surplus from railway and steamship lines for the year carried forward is $18,310,257, against $17,560,519. The special income from the interest on land sales and from other extraneous assets not included in the above was $6,598,151. against $5,158,585. A dividend of 2½ per cent. for the quarter ended June 30 has been declared.

FAR EASTERN RAILWAYS

CHINA

Yunnan Railways.—Reuter's Peking correspondent reported on August 19 that an offer had been made to the Governor of Yunnan by Messrs. Carlowitz through their Hongkong manager, who is also a director of the Hongkong and Shanghai Bank. Messrs. Carlowitz offer £3,000,000 for the construction of a railway from Yunnanfu Eastwards to Peso on West River (? Poseh in Kiangsi). Messrs. Carlowitz offer to furnish both railway material and to finance the undertaking at interest of 5½ per cent. Carlowitz, who represent Krupp's to have for a period of twenty years a monopoly of all Government contracts for the supply of arms and ammunition and all mining and other machinery, and an extensive series of mining concessions along the course of the proposed railway.

Canton-Hankow Railway.—In his report on the trade of Hankow for 1912, Mr. F. A. Carl, Commissioner of Customs, writes, in part, as follows:—

I am indebted to Mr. A. H. Collinson, engineer-in-chief of the Canton-Hankow Railway, for the following interesting remarks on railway work in the Hupeh-Hunan section:— "Survey work was resumed in June last, since when the whole route of the railway has been resurveyed from Wuchang to Yochow, a much better alignment has been obtained, and a saving in length made of slightly more than 11 miles compared with the original survey. The distance by the new route from the zero (which is some 2 miles to the north of Wuchang) to Yochow is 142 miles. The difference in level between the Customs low-water zeroes at Hankow and Yochow is 17.50 feet. The line as finally laid down will pass some 3 miles to the east of Chengling, it having been decided that the traffic prospects at this port do not justify a costly deviation, which would be necessary to bring the railway nearer the town. Access to the river will be obtained by a short branch near the North Gate at Yochow. Between Yochow and Changsha it has also been decided to make a new survey, and three parties are at present engaged on this work, and, from what can be gathered from their preliminary survey, a further saving in length of some 14 miles will be obtained. The policy of keeping inland away from the river, is being followed, and the original somewhat lengthy deviation to Siangyin has been abandoned. The probable distance by the new route from Yochow to Changsha will be about 82 miles, or 225 miles from Wuchang. The difference in levels of the Customs zeroes at Yochow and Changsha is 30.13 feet, making a total rise from Wuchang of 47.63 feet. From Changsha to Chuchow, a distance of 30 miles, a railway has been constructed by a provincial company, which will eventually be merged in the main line to Canton—negotiations for its transfer are still proceeding. Some hundreds of miles of reconnaissance survey have been made from Chuchow to Hengchowfu, and south to Ichanghsien, on the borders of Kwangtung, the country between the latter cities being mountainous and difficult for railway construction. The line has not yet been definitely located beyond Chuchow, but sufficient information has been obtained to estimate approximately the distance by rail from Wuchang to Canton, which will probably not exceed 700 miles. At the present time the engineering staff are busily engaged in completing the survey work, and everything is in readiness to commence construction on the section from Wuchang to Yochow at an early date. The engineers report having met with nothing but friendliness and civility from the officials and country-poeple throughout, and that everyone seems anxious for the construction work to commence. Traffic prospects are also reported to be very good; the line will pass through the tea districts at Yanglowsze and Yanglowtung, while the country south to Changsha and beyond is highly cultivated and prosperous; the railway will tap very rich mineral districts in Hunan, and will no doubt become a great factor in the development of this profitable industry."

SHANGHAI-NANKING RAILWAY

The following figures of traffic returns (approximately) for the week ended July 19 are issued by the Shanghai-Nanking Railway:—

Year.	Passengers.	Goods and Sundries.	Total for the week.
	$	$	$
1913	54,840	10,955	65,795
1912	34,611	8,364	42,975
Increase.	20,229	2,591	22,820
Decrease	—	—	—

For twenty-eight weeks.

Year.	Passengers.	Goods and Sundries	Total
	$	$	$
1913	1,373,260	305,763	1,679,023
1912	1,320,750	196,046	1,516,796
Increase.	52,510	109,717	162,227
Decrease	—	—	—

Week ended July 26.

Year.	Passengers.	Goods and Sundries	Total for the week.
	$	$	$
1913	41,066	8,494	49,560
1912	33,955	8,493	42,448
Increase.	7,111	1	7,112
Decrease	—	—	—

For twenty-nine weeks.

Year.	Passengers.	Goods and Sundries	Total
	$	$	$
1913	1,414,326	314,257	1,728,583
1912	1,354,705	204,530	1,559,244
Increase	59,621	109,718	169,339
Decrease	—	—	—

[The train service was suspended between Changchow and Nanking on July 22. The night train was cancelled on July 23.]

Week ended Aujust 2.

Year.	Passengers.	Goods and Sundries.	Total for the week.
	$	$	$
1913....	28,087	5,014	33,101
1912....	32,111	9,058	41,169
Increase.	—	—	—
Decrease	4,024	4,044	8,068

For thirty weeks.

Year.	Passengers.	Goods and Sundries.	Total.
	$	$	$
1913....	1,442,413	319,271	1,761,684
1912....	1,386,816	213,597	1,600,413
Increase.	55,597	105,674	161,271
Decrease	—	—	—

[The western portion of the line was closed on account of the rebellion and trains were run on an average of 121 miles open.]

Week ended Aujust 9.

Year.	Passengers.	Goods and Sundries	Total for the week.
	$	$	$
1913....	23,884	5,598	29,482
1912....	33,718	9,348	43,066
Increase.	—	—	—
Decrease	9,834	3,750	13,584

For thirty-one weeks.

Year.	Passengers.	Goods and Sundries.	Total.
	$	$	$
1913....	1,466,297	324,869	1,791,166
1912....	1,420,534	222,945	1,643,479
Increase.	45,763	101,924	347,687
Decrease	—	—	—

[Woosung Line traffic closed down entirely from August 3. Main Line: No train running beyond Tanyang this week.]

Wuhu Railway Schemes.—The British Consul at Wuhu, in his report on the trade of that district for 1912, writes:—

The Tientsin-Pukow Railway runs through the north-east of the province.

The railway schemes in the air are:—

(1) Hsin Yang-chou, on the Peking-Hankow line to Pukow, the terminus of the Tientsin-Pukow line. The concession, dating from 1898, is in the hands of the British and Chinese Corporation. Arrangements have been made for the survey, and the line will doubtless be built in due time.

(2) Wuhu to Kuangte and Hangchow The scheme was first mentioned in the trade report for 1905. The company which undertook the construction was purely Chinese and unofficial. The result has been some earthworks for a dozen miles or more, one or two wooden bridges and 100 yards of line laid.

(3) Wuhu to Nanking. This scheme was mentioned in the trade report for 1907.

(4) Hsinyang, on the Hankow line, to near Peng-pu on the Pukow line *via* Shouchou and the valley of the Huai River.

(5) Anking to Shouchou.

The last four are Chinese and will remain ideas on paper without any chance of being completed so long as they are in Chinese hands.

A Consular report from the Chinkiang district of China says:—The traffic to and from Chinkiang station by the Shanghai-Nanking Railway continues to increase, and does not yet seem by any means to have reached its limit of expansion. The arrangement by which goods covered by transit pass are allowed to be carried by rail, an arrangement which has been desired for some years, and only brought about in 1912, has affected the railway returns most favourably.

The Kiangpei Railway scheme has formed a topic for much discussion during the year; but for all practical purposes it might as well have not been agitated, for no progress towards definite action has been made. There have been abortive attempts to raise loans for the purpose, but a feeling is beginning to grow up that, so far as Chinkiang is concerned, the improvement of the canal is of primary, and railway of secondary, importance.

Changsha-Chuchou Line.—Mr. Consul Bertram Giles, British Consul at Changsha, writes in the course of his annual report:—

The bridges on the Changsha-Chuchou line were completed during the year under review, many of them having hitherto been merely temporary trestle bridges. Traffic was carried on without interruption, two trains having been running each way since January, 1912. So far but little goods traffic has been attracted, carriage on the adjacent waterway—the Siang River—being so much cheaper. A certain quantity of coal has, however, been carried from P'inghsiang to Changsha—not the coal of the P'inghsiang collieries, but of smaller mines worked by private companies. A European firm obtained a 200,000 tael order (about £30,000) for additional rolling stock, and a British firm a large order for tools and steel.

A further section from Chuchou to Luk'ou, about 30 *li* (10 miles) in length, was commenced at the end of September, and towards the middle of December about nine-tenths of the earthworks and one-half of the bridge and culvert work reported completed. Two European firms obtained the order for the rails. This section will probably be opened to traffic some time in 1913.

Down to the end of September the capital expenditure on the line, only 33 miles in length, amounted to close on Tls. 6,500,000 (about £960,000). This was stated by the chairman of the railway ata meeting of shareholders held early in October. When the cost of the Chuchou-Luk'ou section, since incurred, is taken into consideration, it will be seen that the total expenditure cannot fall far short of Tls. 7,000,000 (about £1,000,000) for a railway 43 miles in length, of which only 33 miles are completed. When, in addition, it is remembered that the line is very badly laid, that much of the rolling-stock is inferior, and that the receipts are exceedingly small, it will hardly seem surprising that the shareholders should have acquiesced in the policy of nationalisation. On the other hand, they want the whole of the money squandered on a short section of ill-constructed line refunded before they will stop work or hand over the line to the Central Government.

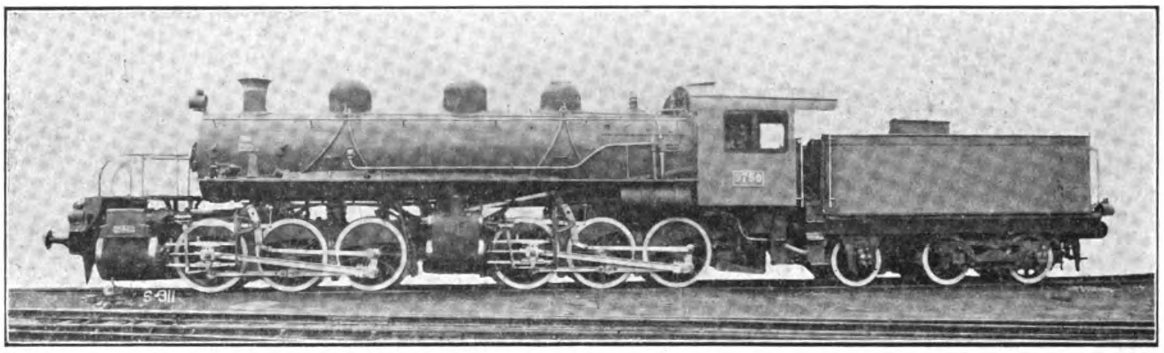
In the meantime the rough survey of the line by British engineers, which was interrupted in 1911 by the outbreak of the revolution, has been completed, and a more detailed survey from the Hupei border to Yochow and thence direct to Changsha, avoiding Siangyin, which it was originally intended to touch, is being carried out, and the actual work of construction is, I understand, to be taken in hand in May, 1913.

The Chuchou-P'inghsiang line is now being reorganised with a view to the regular carriage of passengers and general merchandise, as well as coal. The permanent way is being repaired and strengthened, the old rolling-stock is being patched up, and an order for an additional locomotive and three passenger coaches has been placed in Germany.

The additional levy in aid of railway construction, based on the amount of land tax paid, was resumed last summer, and has hitherto been devoted to work on the Chuchou-Luk'ou section. When the Hankow-Canton trunk line has been nationalised this levy, supplemented by the purchase price paid by the Central Government for the section already built, and possibly also by a foreign loan, is to be devoted to the construction of branch lines. A number of proposals for such branch lines have already been put forward, but in no single case do the financial and other practical aspects of the question appear to have been given a moment's consideration. It is stated that a start will be made with a railway line from Changsha to Changteh and on to Ch'en Chou-fu. Even this line, however, has little chance of being completed at all, much less at a cost which will enable it to cover its working expenses, unless the shareholders will consent to both the construction and the expenditure being placed under foreign supervision.

Railways in Shantung.—The details of the amalgamation of the Shantung Mining Co. and the Shantung Railway have now been ascertained. The stockholders of the railway, in session at Berlin, voted to pay $1,285,000 in railway shares to the shareholders of the mines. It is reported that the main offices will be removed from Germany to Tsingtau. The railway runs from the port of Tsingtau west to Tsinanfu, where it connects with the north and south Tientsin-Pukow Railway. The Shantung Railway carried 908,000 passengers and 705,074 tons of freight in 1911, while the mining company had an output of 459,175 tons of coal.

The long-discussed projects of the Kaumi-Ichoufu railroads and of a steel plant for Tsingtau have been revived. Careful surveys of the commercial possibilities of the territory through which the railroad would pass were made by the German officials toward the close of 1912. The railroad manager in Tsingtau considers the present situation in Europe the chief obstacle to progress on either of these projects. He also states that in his opinion the taxes which would be levied on a steel plant built on Chinese territory will make it necessary to build in Kiaochou, and it is understood that the selection of a site has been discussed with the local government.



Mallet type locomotive constructed by the American Locomotive Company for the Imperial Government Railways of Japan

JAPAN

New Light Railways.—The Japanese Railway Board has granted charters for the construction of light railways to the following railway companies:—

Higashino Railway Company to connect Nishi Nanuno, Nasu district, Tochigi prefecture, with Taishi, Kuji district, Ibaraki prefecture, and also Kawanishi, Nasu district, Tochigi prefecture, with Karasuyama in the same district.

Asama Tozan Railway Company to connect Asama with Fujimi Pass in Yogo village, Watarai district, Miye prefecture.

Seidaiji Light Railway Company to connect Seidaiji with Kubata in Kamimichi district, Okayama prefecture.

Chosu Railway Company to connect Fukagawa with Nishi in Otsu district, Yamaguchi prefecture.

Koya Tozan Railway Company to connect Tsumori Nishinari district, Osaka-fu, with Kizu Kirashima-cho, Minami ward, Osaka city.

Koya Tozan Railway Company to connect Hashimoto with Sumida in Itsu district, Wakayama prefecture.

Awa Electric Light Railway Company to connect Horie with Itanishi in Itano district, Tokushima prefecture.

THE PHILIPPINES

The Manila Railway.—The proprietors of the Manila Railway Company (1906), (Limited), which company owns the securities of the Manila Railroad Company, were to meet on July 24 to receive the report and accounts for the year 1912, and the debenture-holders to consider a proposal to extend the present authorized issues of "A" Debentures and "B" Debentures by £500,000 each. It is necessary to an understanding of this proposal, and of the future of the railway property which the British company indirectly owns, to realize that the railway is still to a large extent in course of construction. Although it is 25 years since the old British company came into existence to take over a concession from the Spanish Government for the construction of a line some 122 miles in length, the present development of the property may be thus summarized; out of a projected 820 miles of road, 479 miles are in operation and 341 miles are yet to be constructed, according to the programme which, under the terms of a concession granted by the Philippine Government, must be completed by the end of 1918. In the three years 1910-1912 183 miles of new road were opened to traffic, and the large proportion which that bears to the total length of line under operation at the end of 1912, nearly two-fifths, is strongly suggestive both of the progressive policy to which those who control the property have committed themselves and, in the light of the development of earnings, of the real progress which the railway has made, for the average net earnings per mile on the 283 miles of 1909 were £405, while on the 466 miles of 1912 they were £485, an improvement of nearly 20 per cent.

The large construction works in hand make the raising of further capital a necessity. Nevertheless it is not the intention of the board to make any further issue of bonds. The bonds which the security-holders are asked to authorize can be used as collateral security for temporary financing, and it is not an unreasonable supposition that as time goes on an improvement in the company's general credit and a fall in prevailing rates of interest will combine to raise the market price of the "A" and "B" Debentures and thus enable the board to issue, on more favourable terms than could be commanded at present, such amounts as

seem desirable to add as a permanent charge on the undertaking. The argument that the board would have been better advised to seek an extension of the share capital in the form of Pre-Preference shares—which has been suggested—will be immediately dismissed, we venture to say, by any person who studies the accounts and is acquainted with the common conditions of construction financing, rendered especially stringent as they are to-day.

It is true that the company's property will appear somewhat overweighted with bonded indebtedness if and when the new Debentures are issued publicly, but before that necessity arises it is possible that an increase of the share capital on favourable terms will have been made practicable by the improvement in earning power, in which case the company can then take advantage of that state of affairs and complete a financial operation which will be much more economical and much more sound than any attempt to finance the present requirements by the issue of privileged share, which, if we mistake not, could only be done on distinctly extravagant terms. Debenture-holders who are disposed to object to the extension of what is in effect a "closed mortgage" on the ground that their proportionate security will not appreciate as it would if junior securities were created may have something to say on strictly logical premises but the question of the good of the whole company on broad grounds is more important. What best facilitates the completion of the construction programme will greatly improve the proportionate security for the Debentures, and bondholders are often well-advised to look somewhat further than the mere question of the enforcement of their security. The scheme is approved by the Merchants Trust (Limited), who are trustees for both classes of bondholders.

Since the Manila Railway Company derives all revenue from its investments in the Manila Railroad Company of New Jersey, it is to the accounts of the latter, the operating Company, that we must turn in order to mark the progress of the property, and a comparison between the operating revenue results of the past two years is of some interest in this regard:—

	1911.	1912.
Miles of road open end of year	426	466
	£	£
Gross Operating Revenue	355,604	436,821
Total Operating Expenses	160,974	210,829
Net Operating Revenue	194,630	225,992

Treating the mileage cited as though it were average mileage for each year, we thus see that, while the length of road increased by 9.4 per cent, the net earnings increased by 16.1 per cent, and the net earnings per mile of road by 6 per cent. Other income was £36,652, bringing total income, before taxes and charges, to £262,645. Taxes and interest charges absorbed £221,834, so that the surplus for the year 1912 was £40,-811, comparing with the £35,548 in 1911, which served to extinguish a debit balance of £30,900 to profit and loss account on January 1, 1911. On the strength of this result the American company declared a dividend on its Seven per Cent, Cumulative Preferred stock to October 1, 1908, absorbing £37,773, the payment of which will leave it a balance of £7,580 at the credit of profit and loss as at the end of 1912. In all these money figures we have taken the peso as equal to two shillings.

For this dividend on Manila Railroad Preferred stock the English company has taken credit in its 1912 revenue account, bringing its gross revenue to £221,000. From this amount have to be deducted £16,000 for general interest, £155,000 for bond interest, and £5,000 for office and general expenses, showing a surplus of £45,000 on the year In respect of 1911 a dividend of 1 per cent. was paid in July, 1912, on the £2,000,000 Five per Cent. Non-Cumulative Preference stock, leaving £60,000 brought forward to the 1912 revenue account, so that the board have £105,000 to deal with. They again propose to pay 1 per cent. on the Preference stock, leaving £85,000 to be carried forward. The company therefore earned 2¼ per cent. on its Preference stock, and it is proposed to carry forward the equivalent of 4¼ per cent.

This displays a rational and prudent policy as to dividends, to which the board may be trusted to adhere. Distinctly optimistic forecasts were made in the market as to the dividend to be paid on the Preference stock this year, which doubtless account for the price having been as high as 43. The present price of 34, however, shows no very violent reaction, as such things go, and a 3 per cent. basis must be held to reflect the most hopeful views of the future of the stock. The stock, however, is said to be chiefly in strong hands, and, looking forward five years to the completion of the herring-bone formation of the whole present construction programme, that optimism is probably justified. Once the £100,000 annually which is needed to pay the full Preferred dividend is comfortably in sight is will require but very little progress, relatively, to bring the £10 Ordinary shares into the dividend-bearing line, for there are less than £400,000 of them in amount. The shares are not officially quoted, and dealings are so infrequent as to be always a matter of negotiation; but the price of about 55s. clearly indicates, under the circumstances, that there are those who indulge the most roseate anticipations to as the company's future.

At the meeting of the shareholders a year ago the chairman of the company read an extract from a mercantile periodical published in Manila, and in no way connected with the railway, one portion of which may appropriately be quoted:—

The experience of the railroad, even in the short distance which it has gone, has shown that the resources of the country have been most inadequately estimated. Where the planters are unable to get to market that which they are already producing they have little incentive for increasing the area under cultivation; but now that the railroad is taking out produce that formerly was allowed to rot on the ground unheeded, and their incomes are being augmented by what formerly brought in nothing, they are turning their attention on every side to extending their present area of cultivated ground.

An example of the manner in which the line "makes traffic" may be cited. Three years ago the company prepared to deal with the orange crop in the Santo Tomas district, and estimated the amount to be hauled at 1,500 tons. In the event, the output was six times that bulk, or 9,000 tons. Much land is being newly brought under cultivation, and while that development is going on rapidly, there is little prospect of its being checked for some years to come. On the whole there is at least a fair prospect of the company's property earning an adequate return for its owners by the time the construction now in course of being carried out is complete, and, in view of the improved earnings of the last two years, it will not be very surprising if that happy stage is reached even earlier.

The Baguio Branch.—The *Manila Daily Bulletin* reports:—So far has the construction work on the Baguio branch of the Manila railroad progressed that the passenger equipment has been ordered and is expected to arrive in Manila during the latter part of 1914.

On the 39.9 kilometers of the branch grading has been completed on 12 kilometers of the Aringay end and on an equal stretch of the Baguio end.

So far P1,773,415.71 has been expended for construction purposes, including the contractors' profits. Of this sum P1,181,277.26 was used for the section between Aringay and a point near the Irisan river. The remainder was expended on the section between the Irisan river and Baguio.

Sixty per cent. of all the grading quantities along the road have already been moved, and on June 30 seven kilometers of track had been laid. The construction of bridges along the railroad has not progressed very far, but from now on bridges will be put in in rapid succession. Three of the 123 bridges have already been completed. Bids have been solicited for 30 more.

The special rack-track material which will be used for 14 kilometers of the road where a rack-track system will be installed has been ordered, and delivery is expected to begin soon. One second-hand rack locomotive has been delivered and will be used for construction purposes. Six rack locomotives will be used in the regular service. Of these three are expected to arrive here by March, 1914, and the remainder by November, 1914.

Of the three tunnels, the one nearest Aringay is nearly completed. Satisfactory progress has been made on the other two.

Between 2,000 and 4,000 men are constantly being employed on the construction work. At the present time the construction force numbers 3,500.

SIAM

The Royal Railways.—A correspondent writes to the *Bangkok Times*:—Railhead is about twenty kilometers away from Nakon, and Phra Ramphai thinks it might be at Nakon in two months' time. But although the earth work is ready no bridge timbers are out. The bank through the deep swamp at Nakon is made only half width until railhead gets through, when material can be more cheaply obtained to complete it.

From Ronpiboon the Singora railhead is being pushed out to the west some five miles to a quarry there before being carried into Nakon. Blasting of rock cuttings is still in progress to the east of the tunnel, whilst a lot of concrete work has still to be done. Timber work here is fairly well advanced. As far as the tunnel itself is concerned it is very hot, and one risks a broken leg in the semi-darkness and a cold on coming out. The heading is through and the widening out and lining is now just over 90 metres in. Some 160 metres remain to be widened out and lined before a train can pass through. Then work will be commenced on a big culvert under a high bank just east of the tunnel. About fifteen months ahead the railheads will probably join up, certainly not under twelve. Siamese labour has now replaced the Indian and Chinese to a great extent in the tunnel.

Happily with age the colours of the station at Trang are being toned down: still one gets a reminder of their one time brilliance from the priming coat still to be seen on the inside of the pumphouse windows. The passenger trains now run once daily between Trang and Kao Kao. Some attention would seem to be necessary to the roofs, and in a shower the rain comes through the innumerable ventilators and sides of the new stock Bogie rolling stock will be a big improvement on the track. It will be about December when passenger traffic is opened to Tung Sawng, North of Kao Kao many timber bridges still remain to be built, and the line has yet to be lifted clear of the floods in some places. While the line south of Kao Kao is open for traffic much remains to be done, and we were often forced to cross bridges between Tap Teang and Trang "dead slow." On this section some bridges have been rebuilt and others are in hand. A large number of bed sleepers are now being replaced.

At Trang itself the foundations of some of the buildings are giving trouble. The engine shed is cracked in one or two places, and the turntable at high tide is partly flooded. The yard levels would appear to be too low.

Southern Line Tenders

The contract for the supply of eight bogie carriages for the Royal Southern Railway, tenders for which were opened on May 17th, have been awarded to Messrs. Cravens, Ltd., Sheffield. The prices quoted were f. o. b. Middlesboro £14,495 c. i. f. Bangkok £15,897, delivery in 40 to 46 weeks.

MALAYA

Federated Malay States Railways.—The following is from the *Malay Mail*:—The F. M. S. Railways reflect in striking manner the trade expansion of the country. The annual report for 1912, signed by the General Manager, Mr. P. A. Anthony, is published as a supplement to the *F. M. S. Government Gazette*, and if it shows an appreciable rise in working expenses this was to be expected, especially in view of the greater cost of materials and labour, which is one of the principal causes. This remarkable trade development, as Mr. Anthony remarks, continues, and critics of the Department should remember that the extra labour it entails upon the officials came in the train of troubles over which they have had no control. Congestion and delay were to a certain extent inevitable, much as they are to be deplored. The report at the outset emphasises the great importance of the past year in Railway development, for 1912 witnessed the inclusion under the F. M. S. Railways administration of the Johore State Railway and the Singapore Government Railway. The sum for the purchase of the latter was voted at the last meeting of the Federal Council, and the amount set aside for the Johore Railway approved by Council, who heard from the Chief Secretary, Sir Edward Brockman, that it is possible the further negotiations with the Johore Government may come to nothing. Be this as it may the year 1912 in every way added greatly to the responsibilities of the F. M. S. Railways administration.

The report mentions that the dividend earned on a capital of $59,444,038.84 was 4.56 per cent. after paying the rents of leased lines, "as compared with 6.03 per cent. Federated Malay States Railways only in 1911." One excellent result of increased business has been the reduction in fares and rates which it has enabled the Railways to allow. On the first class fare this reduction has been from six cents to five cents per mile, and on the second class from four cents to three. The past year also saw a big drop in parcel rates and the sum charged for the carriage of firewood. Then also, truck rates were introduced for constructional steel and iron work, corrugated iron, rubber cups in cases and crates, and wooden cases or chests in parts for making up into rubber chests. All classes of goods over long distances are now carried at a reduced figure.

The total mileage of lines open for traffic, including those leased on December 31st, 1912, was 734 miles, 15 chains, an increase of 175 miles, 13 chains. This includes the Semantan-Kuala Krau and Kuala Krau-Kuala Teh lines opened during the past year. The length of sidings with the increase provided in 1912 is given as 92 miles, 23 chains, with 826 miles, 38 chains of railroad now in operation. The capital account on the open lines amounted to $59,444,038.84 at the close of the year under review, representing an increase of $4,730,745.28 over 1911. In the total expenditure on account of special services on capital account during the year, $1,156,981.31, the largest sum is $210,948.46 for additional wharf accommodation, and $102,181.87 for a new timber tongkang wharf, at Port Swettenham. For the new Station and Hotel at Ipoh $125,248 was provided, and other necessary expenditure, the totals of which reach somewhat similar amounts, was upon additional passenger stock, locomotive, and goods vehicles.

It is interesting to note that the average capital cost per mile of line open to December 31st was $99,333.04, considerably higher than that at the end of 1911. A number of lines are still under construction, and will materially add to the length of railways operated. The capital account of these amounted to $5,283,227.54, an increase of close upon a million dollars. Much has been done in the direction of permanent and trial surveys. As a revenue earner the Railway continues to forge ahead, and the gross earnings from all sources, including motor services, amounted to $8,421,016.87 as compared with $7,718,239.75 in 1911, an increase of 9 per cent. The gross working expenses were heavy—$5,754,671.64, the increase being well over a million dollars. A sum of $527,073.88 appears in this connection under the heading of engineering. In 1912 the railways carried 11,589,273 passengers, an advance of 1,240,377.

There are many other figures of interest in the report, which, on the whole, considering the exceptional circumstances previously referred to, may be regarded as satisfactory.

MONGOLIA

Railway to Kiachta.—The Russians have commenced the construction of the Railway Line from Werchne-Udinsk to Kiachta.

MANCHURIA

South Manchuria Railway.—Y. 43,632 was the daily average of the S. M. R. traffic returns for the last decade of July. It denoted an increase of Y. 12,121 on the corresponding period of last year. The daily average for the whole month of July was Y. 44,187, being an increase by Y. 7,850 on the corresponding month of last year. Figuring since the beginning of last April, the aggregate receipts up to the end of July amounted to Y.6,528,269, which means an increase of Y. 1,461,716.

TRAMWYAS

Shanghai Tramways

The following is the traffic return of the Shanghai Tramways (Foreign Settlement) for the month of July, 1913, and for seven months ended July 31, 1913, with figures for corresponding periods last year.

	July, 1913.	July, 1912.
Effective Receipts	$86,676.91	$68,758.03
Passengers carried	4,552,571	3,580,909
Car Miles run	262,808	240,511
Loss by depreciation of subsidiary coinage	24,666.24	21,628.97
Percentage of loss by depreciation of subsidiary coinage	23.24	25.42
	7 months ended July, 31, 1913.	7 months ended July 31, 1912.
Effective Receipts	$510,091.87	$449,438.58
Passengers carried	25,897,237	22,769,485
Car miles run	1,619,119	1,593,133
Loss by depreciation of subsidiary coinage	141,048.89	139,335.79
Percentage of loss by depreciation of subsidiary coinage	22.94	25.23

Week ended July 23, 1913:—

	1913.	1912.
	$	$
Effective receipts (after deducting loss on subsidiary coinage)	17,998.73	15,065.80
Passengers carried	958,032	789,071
Car miles run	55,579	54,647

The loss by depreciation of subsidiary coinage for the week was equal to 23.58 per cent. of the gross cash collected on the cars, as compared with 25.36 per cent. for the corresponding week last year.

Week ended July 30, 1913:—

	1913.	1912.
	$	$
Effective receipts (after deducting loss on subsidiary coinage)	24,187.06	15,782.80
Passengers carried	1,248,331	805,007
Car miles run	36,810	54,085

The loss by depreciation of subsidiary coinage for the week was $6,976, equal to 23.29 per cent. of the gross cash collected on the cars as compared with $4,786, equal to 24.70 per cent. for the corresponding week last year.

[During the week ended July 30 the passengers carried on the International Settlement tramways totalled 1, 248,331,—a record figure. Practically 3,000,000 coins, weighing about twenty-two tons, were collected].

Week ended August 6, 1913:—

	1913.	1912.
	$	$
Effective receipts (after deducting loss on subsidiary coinage)	20,208.15	16,008.76
Passengers carried	1,062,236	828,376
Car miles run	59,885	54,878

The loss by depreciation of subsidiary coinage for the week was $5,917.75, equal to 23.66 per cent. of the gross cash collected on the cars as compared with $4,843.66, equal to 24.54 per cent. for the corresponding week last year.

The Nantao (Shanghai) Tramway.—The Nantao Tramway began operations early in August.

FINANCIAL

Hongkong and Shanghai Banking Corporation.—The 96th half-yearly meeting of this Bank was held at Hongkong on August 16, Mr. S. H. Dodwell presiding.

The Chairman said: Gentlemen,—The report and statement of accounts having been in your hands for some time, I shall, with your permission, take them as read. I think you will agree that another very satisfactory result is added to the records of the Bank, and I trust you will approve of the proposed division of profits, which is practically the same as the distribution made at this time last year, viz.:—

A dividend of £2 per share.

$250,000 added to the silver reserve fund.

$250,000 written off Bank premises account.

The balance remaining to be carried forward to the current half-year amounts to $2,052,482.91, being some $41,000 more than was brought in from the previous account. You will see from the report that a part of our earnings has again been diverted to writing down sterling reserve fund investments. The great demands on capital of late and consequent high rates of interest obtainable have caused a further decline in all first class securities, making it necessary to readjust our book values below the point which, last year, we had hoped would prove low water mark.

Our holding of £1,200,000 Consols has been written down from £900,000 to £864,000 and now stands in the books at 72, and other sterling securities from £334,950 to £329,100; to effect these adjustments and maintain the fund at £1,500,000 we purchased £45,000 3 per cent. exchequer bonds due 1930 at 97⅛, which have been placed in the books at 93. The net cost, viz., £43,918 11s. 11d. at 1/11 9/16 —$447,340.60, was, as already mentioned, met out of the half-year's profits. Recent experience makes one somewhat diffident in venturing an opinion with regard to future values of even first securities: I shall therefore confine myself to the remark that our investments seem to be written down to very conservative figures.

I may mention that the same remark also applies to investments outside the sterling reserve fund, appearing in the accounts under heading of "Indian Government Rupee Paper," and "Colonial and other securities." Apart from the sterling reserve fund, there are few changes of outstanding interest in the figures of the balance sheet. The total of current accounts and fixed deposits in gold is £9,300,000 against £10 millions on December 31 last and £9¾ millions on June 30, 1912, and

silver current accounts and fixed deposits stand at $30 lakhs below the December figures, but $53 lakhs higher than at this time last year. Bills payable show an increase of some $10 millions compared with the figures of a year ago, while on the other side of the account, cash, coin lodged with the Government against note issue, and bullion in hand and in transit, taken together, are $78¾ millions against $69 millions on June 30, 1912. Bills discounted, loans and credits and bills receivable approximate closely to the figures at this period last year. The only other item to which I shall refer is Bank premises account. This now stands at $61 lakhs and will be further increased during the present half year by some $6 or $7 lakhs for expenditure still to be met. I am sure the policy of continuing to write down our property will commend itself to you. The new building in London is nearing completion, and you will be pleased to hear that we expect to move in some time next month.

Active trade conditions practically all over the world and a good demand for money in most countries have been the features of the period under review, and China, notwithstanding political unrest, has shared in the general activity to a greater extent than might have been expected, if we take into consideration the unprecedentedly large accumulations of silver in the form of bars, dollars, and sycee in Shanghai and North China. Owing to unsettled conditions hard coin has no doubt gravitated to the Treaty ports as being the safest depositories and trade has naturally been handicapped by the fact that money, instead of circulating freely, is being hoarded. Conditions in China were steadily improving until the outbreak of the recent trouble caused another setback, and I regret to say that at present business generally is seriously hampered. It is to be hoped that these internal disturbances will speedily end, as once confidence is restored and merchants are able to move goods with safety, I feel sure we shall see trade active in the Far East.

With regard to the present disturbances, I should like especially to refer to Shanghai, where the recent fighting was the cause of considerable anxiety. I cannot but think that in view of the large population and enormous financial interests in the Foreign Settlements of Shanghai, steps should be taken to prevent life and property being exposed to such grave risks as those lately encountered. The interests of China are identical with those of other nations in this respect, for it is conceivable that losses could be incurred of such magnitude that an indemnity to meet them might cripple the country financially for many years.

When addressing you in February last, my predecessor in the chair announced to you that a satisfactory agreement had been arrived at between the Chinese Government and the Sextuple Group with regard to the terms of a loan of £25,000,000, the concluding formalities of which awaited only the completion of arrangements between the Chinese Government and the Powers interested for the appointment of suitable foreigners to the advisory and executive posts contemplated by the loan agreement. The discussion of this matter took longer than was anticipated, and in the meantime, in the latter part of March, the unexpected announcement was made that the American Group, for reasons which were published in an official communication to the Press, had withdrawn from the Sextuple consortium. The American share was, however, taken over by the five remaining groups, and, on April 26, with the approval of their five Governments, the reorganization loan was signed.

The loan of £25,000,000 was issued on May 21 simultaneously in London, Berlin, Paris, St. Petersburg and Brussels, and the success it achieved bore testimony to the concurrence of the public with the wisdom of the policy which had been so patiently adhered to by our own and the other Governments, and the necessity for proper safeguards in respect to security and the expenditure of funds, on which that policy was based. The purpose of the loan, after liquidating the arrears of the Boxer Indemnity due to the Powers for 1912, aims at releasing the provinces from the present drain upon their resources by the consolidation and centralization of provincial loans contracted under the late dynasty and by the disbandment of unnecessary troops: while, at the same time, it provides the Chinese Government with substantial funds for carrying on the administration during the period of transition from a provincial to a centralized fiscal system, and for the reorganization and reform of the revenue which constitutes the security of the loan.

The efforts of the elder statesmen in Peking to grapple with the immense problems which surround this task of financial reorganization are being watched with the keenest anxiety by all who have the interest of this great country at heart, and who believe, like ourselves, in its recuperative power and immense capability for development under a wise financial administration. It is not too much to say that upon the result of these efforts depends the whole future of China, and her ability to borrow on the markets of foreign nations the further sums which are still essential for the industrial development on which she must depend for her growing economic needs. The solution of these grave and vital questions cannot but be retarded, and the future of the country jeopardized by persistence in party strife and jealousies. The restoration of political cohesion and financial stability must outweigh and precede constitutional ideals, and I express the earnest hope that the younger politicians of China will realize in what direction the efforts of true patriotism should lie, at this, the gravest juncture in the history of their country. Before sitting down, I would like to take this opportunity to express the regret felt by your directors at the retirement of Mr. H. E. R. Hunter. Mr. Hunter has rendered valuable services to the Bank, and I think it only right to refer specially to the able manner in which he managed our Shanghai branch through very trying and difficult times. His sterling qualities are known to everyone who came in contact with him, and I feel sure I voice the feelings of you all in expressing very sincere regret at the loss of his services and in wishing him many happy and prosperous years at home. Before moving the adoption of the report and accounts as presented, I shall be pleased to answer any questions you may put to the chair.

There were no questions, and the Chairman proposed the adoption of the report and statement of accounts, as presented.

Mr. Young said—Gentlemen,—I think you will all agree that the statement the chairman has put before us is a very satisfactory one, and results largely from the talented administration of the Bank's affairs. It is very satisfactory to see the sterling reserve kept at a realizable value of £1,500,000, although to do this has necessitated large drawings from the half-year's profits, and it is to be hoped that we have seen the last of such expenditure. As our chairman pointed out, in this part of the world we have been living in troublous times, and it is with some relief that the present position permits us to have reasonable hopes of a period of peace. It is particularly pleasing to see China emerging from her troubles without, so far as we know at present, having handicapped her development by making herself liable for indemnities to foreign Powers. We now look forward to the times when good government will eliminate such risks as have been recently run by the inhabitants of Shanghai and other Treaty ports. Gentlemen, it is with much pleasure that I second the report. The motion was carried unanimously. The appointment of Mr. P. H. Holyoak and the Hon. Mr. D. Landale as directors was confirmed.

The following relate to Japanese banks:—

Teiyu Bank.—This Bank made a profit of Y125,090.11 for the last term, paid a dividend of 8 per cent. and carried forward Y51,770.57.

Kanagawa Agricultural & Industrial Bank.—This bank made a profit of Y61,328.50 for the last term, paid a dividend of 9 per cent. and carried forward Y11,346.70.

Dai Ichi Ginko.—This bank made a profit of Y990,068.58 for the last term, paid a dividend of 10 per cent. and carried forward Y666,207.62.

Tokyo-fu Agricultural & Industrial Bank.—This bank made a profit of Y132,289.40 for the last term, paid a dividend of 5 per cent. and carried forward Y25,389.40

Hypothec Bank of Japan.—This bank made a profit of Y1,190,586.34 for the last term, paid a first dividend of 5 per cent. and a second dividend of 10 per cent. and carried forward Y106,189.65.

Dai San Ginko.—This bank made a profit of Y277,445.22 for the last term, paid a dividend of 12 per cent. and carried forward Y25,070.58.

Fifteenth Bank.—This bank made a profit of Y2,218,633.52 for the last term, paid a dividend amounting to Y810,000.00 and carried forward Y896,817.95.

Yasuda Bank.—This bank made a profit of Y457,020.82 for the last term, paid a dividend of 3 per cent. and carried forward Y55,568.29.

Dai Ni Ginko of Yokohama.—This bank made a profit of Y214,154.16 for the last term, paid a dividend of 8 per cent. and carried forward Y90,394.16.

Fudo Savings Bank.—This bank made a profit of Y57,809.16 for the last term, paid a dividend of 12 per cent, and carried forward Y21,809.16.

Tokyo Bank.—This bank made a profit of Y181,877.80 for the last term, paid a dividend of 10 per cent. and carried forward Y29,912.22t

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Tanaka Bank.—This bank mads a profit of Y45,206.45 for the last term, paid a dividend of 8 per cent. and carried forward Y12,206.45.

Toyokuni Bank.—This bank made a profi. of Y183,068.39 for the last term, paid a dividend amounting to Y140,000.00 and carried forward Y9,452.47.

Teikoku Shogyo Ginko.—This bank made a profit of Y145,114.27 for the last term, paid a dividend of 6 per cent. and carried forward Y18,486.66.

Tokai Bank.—This bank made a profit of Y104,262.18 for the last term, paid a dividend of 8 per cent. and carried forward Y76,814.39.

Hundredth Bank.—This bank made a profit of Y300,264.64 for the last term, paid a dividend of 10 per cent. and carried forward Y44,264.64.

84th Bank.—This bank made a profit of Y62,033.94 for the last term, paid a dividend of 8 per cent. and carried forward Y21,476.48.

Deutsch-Asiatische Bank.—The report of the Bank for 1912 was as follows:—

The political situation of China has not yet been fully cleared during the period under review and the contrast between the North and the South of the country, which was during the previous year of decisive influence for the outbreak of the revolution, has not yet been adjusted. Nevertheless, setting aside a few local disturbances, the peace could be maintained, and considering the country has such an old history and a population, which adheres more tenaciously than other nations to old traditions, the extraordinary transformation from the Empire, sacred for thousands of years, to the Republic was effectuated under comparatively

insignificant convulsions of the gigantic realm. By far the greater part of the country remained till now untouched by the inner political movements. However if the further development will be effectuated in the same peaceful manner, after a parliament has been created for the first time by which the whole country shall participate at the formation of its destinies, is a question about which it is difficult to form an opinion.

The political situation of the country during the business year has not exercised a considerable influence on commerce. The fact that the single individual was comparatively little effected by the consequence of the Revolution, in conjunction with other favourable circumstances, as good harvests, rising prices for raw-products shipped from China caused the exports to increase considerably.

In consequence of the thereby increased purchasing power of the population and fostered higher value of silver a rise of imports into China is also evident.

A drawback preventing the full development of the favourable moments just pointed out was the unsatisfactory financial position of the Government. The service of the foreign loans could be upheld, however the country requires large means, to carry through reforms and measures which are necessary for the consolidation of the inner conditions.

At the beginning of the period under review, therefore, the Government entered into negotiations with the international Sextuple Group with the object of contracting for a loan of £25,000,000. In the meantime the American Group has retired from this syndicate. The final agreement has been signed a short time ago; we are interested in this loan, out of the proceeds of which also the advance amounting to about Taels 12,000,000—granted to the Chinese Government on which we reported a year ago are to be repaid to the negotiating groups.

The value of the Mexican Dollar in circulation in China has declined again to its normal price; on the 31st of December, 1912, the relation in the value of the Dollar to the Shanghai Tael was 100: 73 5-8 against 100 79-3—5 on the 31st December, 1911.

We have therefore credited again the "Valuta Ausgleichs-und Dispositions-Fonds" for the amount taken from it last year.

The economical development of Japan has also made satisfactory progress, exports as well as particularly the import trade show a considerable improvement. The result of our branches, with an increased turnover, were a little better than during previous year, they were, however, as before influenced by the keen competition of Japanese banks.

India had again very good harvests, the foreign trade has therefore increased considerably as compared with the previous year. The results of our branch in Calcutta are satisfactory. The hoarding of gold noticed for some years already could also be observed in an increased manner during the last year under review, and the importation of silver for private account fell off. However on account of the good proceeds derived from the harvest an increased demand for silver coin made itself felt in such a way as to cause the Indian Government to buy £6,000,000 worth of silver for coining purposes. This as well as the brisk demand for silver from China in expectation of the aforesaid great loan, exercised a decided influence upon the movement of the silver market and raised the rates under considerable fluctuations to a height that had not been attained for five years.

The traffic of the Shantung Railway shows a further considerable increase, which is also shown by the financial results of last year's working. It will be proposed to the ordinary General Meeting to distribute a dividend of 7½ per cent. for the year 1912 on shares and M 12.50 on Net-Profit certificates. Negotiations with the Shantung Mining Company were entered into and concluded quite recently and the Mining Company as a whole will be taken over by the Railway Company. The shareholders of the Mining Company will receive for their property of M 12,000,000 shares, nominal M 5,400,000 shares of the Shantung Railway Company with coupons attached for dividend from 1st January, 1913. Through this amalgamation the funds will be provided for a rational development of the mines so that it can be relied upon that the output of the mines will yield adequate revenue to the Shantung Railway Company in future.

Our Investment Account consists principally of Loans to different Chinese Provinces which are guaranteed without exception by the Central Government. The latter has promised to effect the repayment of these loans with accumulated interests out of the proceeds of the above mentioned reorganisation loan, while so far the provinces have been debited with the interest.

As regards the law suit repeatedly referred to in our former annual reports and brought against us by the Imperial Treasury in the year 1907 judgment was given in our favour by the two lower courts. However the Supreme Court reversed the decision and referred the case back to the Lower Court [Kammergericht] which following the direction given by the Supreme Court after a new sitting gave judgment against us. The Managers as well as the Directors are unanimously fully convinced that the Bank is wronged by this lawsuit and that the judgment of the Supreme Court is based upon a conception of circumstances contradictory to commercial principles. Highly esteemed commercial experts who are quite independent from our bank have confirmed in long elaborations the view we have taken in the matter. As it is not impossible in the face of the attitude of the Supreme Court that notwithstanding our opposite view of the case the final issue of the lawsuit will be unfavourable to us, we have thought it expedient to put aside an amount of Taels 140,000—M 350,000. The loss of such a big amount would be felt so much more severely as this difference which resulted from the settlement of exchange contracts made on behalf and in the interest of the German Government would mean an extra profit to the Imperial Government because they have received all the money which they could demand from the Chinese, while we have derived no benefit out of the transaction except the usual commission we have charged. To our knowledge no other Foreign Government has claimed from their respective bank a corresponding amount. Without this amount set aside we would have been in a position to propose a higher dividend then 5 per cent.

At the end of the business year Dollar and Tael banknotes of our issue were in circulation to the amount of Taels 2,200,989.94.

Our Mortgage Department with its limited field of operation could again do a very trifling business only and has therefore closed with a loss.

We have dissolved the Delcredere account figuring in our last balance sheet and transferred the amount of Taels 20,000 to the Special Reserve Fund.

We propose to distribute the net profits amounting to Taels 512,087.08 as follows:

Transfer to Special Reserve Fund......	50,000.00	
Dividend M 125 00 per share = M 937,500.00 a M 2.50 p. Tael....	375,000.00	
Director fees..	6,521.74	
Amount carried forward to New Account.............	80,565.34	512,087.08

We have nothing to add to the report, balance sheet, and profit and loss account, which have been examined and found correct by the Auditors' and we propose they should be adopted.

Messrs. Geheimer Kommerzienrat Hugo Oppenheim, Kommerzienrat Albercht Otto, Director S. Schwitzer and Mr. Franz Urbig retire from the Board of Directors by rotation and are again eligible.

At the end of the business year Mr. Curt Erich retired as manager of the bank, to which he belonged since its foundation. We wish to express our gratitude and thanks for the valuable services he has rendered to the Bank during this time. We shall propose at the shareholders, meeting in order to preserve his experience to the Bank to elect Mr. Erich as member of the board of directors.

Loan to Hunan—Considerable discussion has taken place in regard to a loan alleged to have been made to Hunan by a Japanese company called the Asahi Shokai. We take the following from the *North-China Daily News:*—The following is a translation of the contract for the loan to Hunan of Y.10,000,000, subsequently increased to Y.15,000,000, which the Provincial Assembly of Hunan concluded on July 26.

The Governor of Hunan Province, in order to extend the mining administration, orders the Hunan Provincial Treasurer and the Hunan Board of Mines hereby to contract with the Japanese Sunrising Company a provincial loan. The articles are as follows:—

1. The total amount of the loan is Y.10,000,000, of which Hunan receives 89 per cent.

2. The loan is to be paid in three instalments of Y. 5,000,000, Y. 3,000,000, Y. 2,000,000, the first instalment to be handed over within one month after signing the contract, the second instalment within six months, the third within twelve months

The whole amount is to be handed over in Shanghai. No charges to be paid for expenses, exchange, etc., apart from the commission of 11 per cent. indicated above.

3. This loan to be used only for opening mines, but for the temporary financial necessities Y. 5,000,000 should be deposited in the Hunan Government Bank for lowering exchange. The rest of the loan also to be handed over to the Hunan Government Bank whence the money is to be paid to the Hunan Board of Mines according to order papers issued by them. The Company can inspect the proper use of the money at any time.

4. The interest of the loan is to be 6 per cent. per annum, beginning from the day on which the money is handed over, and paid half-yearly. The interest will be paid in Shanghai. If there are no profits on mining, the interest will be paid by the local salt gabelle.

5. The limit of the loan is twenty years. For the first five years only the interest is to be paid. From the sixth to the tenth, Y. 400,000 of the original capital will be repaid annually with the interest. From the eleventh year onwards, interest and repayment of capital will be forthcoming according to equitable arrangements. This money to be deducted from the selling price of mineral ores. If the mining is not productive repayment will be made as under Article 4. The Hunan Government may repay the whole loan after fifteen years.

6. The security for this loan is the Government mines, except the Suikowshan lead ore mine. (On this mine there is already a foreign loan.—Ed.)

7. Until the Company has inspected the Pingkiang gold mines and Kiangwah tin mine, a second security for this loan is the local salt taxation. As soon as the above-mentioned two mines can produce Tls. 1,000,000 every year the second security will be cancelled.

8. The Company will recommend a good mining engineer to Hunan, to be in charge of all Government mines, for whom salary and and other expenses will be arranged afterwards.

9. The mining produce will be sold through the commission of the Company for twenty years (Suikowshan mine is excepted.) The price will be reckoned according to London quotations.

10. The Company will put a man in Hunan to advise the mining business and to look after finance.

11. If the Hunan Government wants to raise another loan for mining purposes it must first consult with the Company. If no arrangement is concluded within six months, the Hunan Government may negotiate with another Company. The Company will have the right of supplying machinery and materials if on terms as good as those offered elsewhere.

12. Four copies of this contract signed by the Hunan Provincial Treasurer and by the Board of Mines, chopped by the Hunan Governor, should be written both in Chinese and Japanese, one for the Hunan Governor, one for the Japanese Consul in Changsha, one for the Hunan Provincial Treasurer, and one for the Japanese Sunrising Company.

The Industrial Bank of China.—We are informed that the Banque Industrielle de Chine, a joint stock company with a capital of Frs. 45,000,000. has been definitively and legally constituted in Paris, on the 5th of July, 1913. The Board was elected at the meeting of the shareholders and formed as follows: MM. Andre Berthelot, President; Liao Sze Kong and Eugene Henry, Vice-presidents; Sir Richard Awdry, Georges Ballu, Raoul Calary de Lamaziere, Rene de Cerenville, Paul Chautard, Comte Arthur Espinasse de Villesboinet, A. Frezouls, Comte Gerard de Ganay, J. Perchot, Charles Victor. The Banque Industrielle de Chine has its Head Office (siege central) in Peking and its registered office (siege social) in Paris, 13 Boulevard Haussmann. The General Manager s M. A. T. Pernotte.

Foreign Loans for Japanese Companies.—Japanese industrial concerns—the Oji Paper Mill among them—are, says the *Asahi*, negotiating with London banks direct for loans, taking a new departure in the method of borrowing from abroad. Business loans raised abroad in the past have generally been in the form of debentures, or have consisted in machinery imports representing cash. The Oji Paper Mill Company has just negotiated a loan of Y.2,000,000 bearing 7½ per cent. interest from the London County and Westminister Bank, through the medium of the Mitsui Bank and guaranteed by the Specie Bank. This example has been followed by the Ensuiko Sugar Company, of Formosa, which has negotiated a loan of Y.2,000,000 bearing interest at 7½ per cent. from Parr's Bank, through Messrs. Samuel Samuel & Co., and by the Kanegafuchi Spinning Company, which has negotiated a loan of Y.1,000,000 at about 7 per cent. interest through the Mitsui Bank from the same London bank. For these loans the Japanese companies have drawn promissory notes. The term of the notes drawn by the Kanegafuchi Spinning Company, continues the Osaka journal, is three months, which it is agreed may be renewed indefinitely. The credit banks and other banks interested in the loan are each to receive a commission of 1 per cent., the rate of interest to be based on the official rate of the Bank of England, which is now ruling at 4½ per cent. When the commission payable to the banks and the expenses of exchange are added, the interest rate will amount to about 7 per cent., which is no lower than the rate in Japan. But these loans have been contracted in anticipation of a further advance of the rate in Japan. The money was expected to be received by the Kanegafuchi Mill and the Oji Paper Mill by the middle of August.

Anglo-Japanese Bank.—The Seventh Annual General Meeting of the shareholders of the Anglo-Japanese Bank (Limited) was held at Winchester House, Old Broadstreet, London, Mr. Alexander F. P. Roger, the chairman, presiding.

The London Manager and Secretary (Mr. Arthur H. King) read the notice convening the meeting and the auditors' report.

The Chairman, in moving the adoption of the report and accounts, observed that some seven years ago the company was formed for the purpose of transacting banking business in Japan, but for the first five years of its existence a period of abnormally cheap money prevailed in that country. It was true that that period seemed to have come to an end—at all events, temporarily—but the experience they had gained was that the difficulties in the way of an English bank doing business in Japan were very great, owing, among other things, to the necessity of relying in a great measure on Japanese advice and, to a certain extent, losing English control. There had been many other real difficulties operating against the bank, but the directors had loyally and assiduously attended to the interests of the shareholders.

Not being able to employ all their funds in Japan they had been obliged to work up business and a connection on this side, and that part of the business had proved to be more remunerative than the Japanese business—so promising, indeed, that the directors considered it should be encouraged and developed. A small and profitable business had been built up in Japan, and it was proposed to continue to develop it. He had received one or two letters from shareholders expressing regret, and, he thought, probably justifiable impatience, at the fact that the directors were unable to declare a dividend on that occasion, and suggesting the liquidation of the Bank. Because he joined the board representing large shareholders who did not acquire their shares until recent times, he thought that he, above all others, was in a position to express an opinion as to whether liquidation at that juncture was or was not desirable, and he gave his opinion unhesitatingly in the negative. The bank was now doing a small but sound business, which was capable of considerable expansion. New blood had been infused. New connections had been and were being secured, and, given time, he felt confident that they could make the bank a successful institution. (Hear, hear.)

Turning to the accounts, he stated that the figures as a whole showed expansion, in view of which the directors had strengthened the bank's financial position, cash on hand being up £10,000, loans and advances by them were £18,000 more, while the two items of bills discounted and bills receivable, taken together, showed an improvement of more than £9,000 over last year's figures. Perhaps the most satisfactory feature of the accounts was the growth of the current and fixed deposits from £6,000 to £49,000. The whole of the increase of deposits was in London, which was a significant point. The directors had thought it desirable to make a special reserve for doubtful debts and other contingencies amounting to £5,000. They had, in addition, transferred £10,000 to reserve, increasing it to a total of £35,000, and leaving a balance of £4,571 to be carried forward. The depreciation in their investment had considerably increased since the date of the last balance sheet—an experience shared by other similar institutions, but they believed that the depreciation would diminish. The largest shareholders were doing everything in their power to increase the business of the bank, and the directors felt that the other shareholders should follow suit. (Hear, hear.) As the business expanded in this country, it might be that it would be desirable to alter the name of the bank, so as to cover a larger area for their operations. It might be also that, as the business expanded, they would have to increase the capital, but the directors would postpone that step as long as they possibly could.

Mr. J. MacAndrew seconded the motion.

In the discussion which followed, dissatisfaction was expressed at the position of the bank, and an amendment was brought forward for adjourning the meeting for three months and appointing a committee to inquire into and report upon its affairs. Other speakers, however, thought that further time should be allowed to see if the bank could be placed on a dividend paying basis. Dissatisfaction was also expressed at the resignation by Sir Westby Perceval of the chairmanship of the company and of his seat on the board.

The Chairman, in reply, said that for the reasons he had stated, and in the interests of the bank, he could not put the amendment. Sir Westby Perceval had piloted their ship through very troubled waters, and had thought that, as he had brought the vessel into what he conceived to be smooth waters, he was entitled to retire. (Laughter.) The depreciation in the bank's investments was almost entirely in those which were first acquired. He would not predict, but he thought that in three years they ought to be paying dividends. The current price of the shares was, he said, 2¾.

A Shareholder.—You can have mine at that figure.

The Chairman.—I will take them. Continuing, he stated that the directors would give shareholders who called at the office every possible information and every facility for investigating the securities. He then put the motion for the adoption of the report and accounts, and declared it carried unanimously.

The retiring director, Mr. H. M. Read, and the auditors, Messrs. Woodthorpe, Bevan, and Co., were afterwards re-elected, and the meeting closed with a vote of thanks to the chairman.

COMPANIES

Dai Nippon Brewery Co., Ltd.—At the general meeting of shareholders of the Dai Nippon Brewery Co., Ltd. (Asahi Beer) the results for the first half of the year were to be declared as follows:—Net profit for the term, Y.614,921.17; balance brought forward from preceding term, Y.429,255.22; total Y.1,044,176.39. It was to be proposed that this should be distributed as follows:—Legal reserve, Y.45,000; bonus to officers, Y.30,746.05; dividend (13 per cent. per annum), Y.488,800; employees, pension fund, Y.25,000; carried forward to the next term, Y.454,630.34.

Tokyo Gas Co.—This company made a profit of Y.1,811,204.47 for the last term, paid a dividend of 10 per cent. and carried forward Y.37,733.02.

Tokyo Building Co.—This company made a profit of Y.213,373.56 for the last term, paid a dividend of 9 per cent. and carried forward Y.8,852.27.

Central Stores, Ltd. (Shanghai).—This company has reduced its capital from $751,845, divided into 50,000 ordinary shares of $15 each and 123 founders' shares of $15 each to $375,922.50, divided into 50,000 ordinary shares of $7.50 each and 123 founders' shares of $7.50 each, and such reduction was effected by cancelling capital which had been lost or was unrepresented by available assets to the extent of $7.50 per share of each of the 123 founders' shares, and of the 34,958 ordinary shares which had been issued and were outstanding and by reducing the nominal amount of all the founders and ordinary shares in the Company's authorised capital to $7.50 per share.

Tokyo Fire Insurance Co.—This company made a profit of Y.276,933.79 for the last term, paid a dividend of 8 per cent. and carried forward Y.16,838.25.

Imperial Hemp Weaving Co.—This company made a profit of Y.2,138,388.34 for the last term, paid a dividend of 12 per cent. and carried forward Y.21,248.61.

Dai Nippon Artificial Fertiliser Manufacturing Co.—This company made a profit of Y.445,571.16 for the last term, paid a dividend of 11 per cent. and carried forward Y.24,033.05.

Mitsui Mining Co.—This company made a profit of Y.1,169,063.53 for the last term, paid a dividend amounting to Y.350,000.00 and carried forward Y.905,462.50.

Toshin Godown Co.—This company made a profit of Y.75,767.90 for the last term, paid a dividend amounting to Y.40,000.00 and carried forward Y.21,481.49.

Nippon Shosen Kaisha.—This company made a profit of Y.11,351.15 for the last term, paid a dividend of 4 per cent. and carried forward Y1,977.05.

Kanegafuchi Cotton Spinning Co.—This company made a profit of Y.1,851,523.57 for the last term, paid a dividend of 12 per cent. and carried forward Y.1,614,390.73.

INDUSTRIAL.

Messrs. Lever Bros., Ltd., Kobe.—The soap factory of Messrs Lever Bros., Ltd., Mr. C. U. Stuart, formerly of Dairen, Manager, located at the mouth of the Muko River, Amagasaki, near Kobe, disposes of about 3,000 pieces of bean cake imported from Manchuria daily. The bean cake is put through a chemical process for extracting the oil still left in the cake to the average amount of about 7 per cent. The oil thus extracted is used for the making of soap. It is not clear what disposal is made of the bean meal left after the extraction of oil, but there is little doubt that most of it passes into the hands of fertilizer dealers. The annual consumption of bean cake by this Factory is put at about 80,000,000 pieces or about 25,000 tons.

Japan Paper Mills.—With the yen 2,000,000 borrowed, the Oji Paper Mill (Japan) Company will effect extensions of its plant to produce 3,000,000 lbs. a month of news printing paper.

An extension of the works of the Noda Paper Mill Company for producing an additional 200,000 lbs. a month having been almost completed the new machinery is to be started shortly.

The proposed extensions of the Kokura and Umezu Mills will come next under the agreement, and their completion will add to the monthly production 300,000 or 400,000 lbs. each. Their financial position, however, may not allow them to take the extensions in hand in the course of this year.

Other large mills are still withholding the particulars of their plans of extension.

Extensions of the Fuji, Mitsu Bishi, and Okawa paper mills have been decided on, but the work of extending these mills will not be started this year, for financial reasons.

The Yukensha, the Kyushu, and some other paper mills had projects for extension, but have abandoned them because the demand for the classes of paper they contemplated manufacturing has not increased to the extent anticipated.

The schemes that seem likely to be carried out, will increase the annual production of paper in Japan to about 120,000,000 lbs., and the mill extensions for this purpose will be ready to begin operations by 1917.

MINING

Colorado (P. I.) Mines.—Fifteen hundred ounces of gold bullion from the Colorado Mining Co.'s mines in Masbate Island were received in Manila on July 26. The shipment represented a fifteen days' run and was estimated to be worth P. 36,000.

Tin in China.—The output of tin from the Kochiu mines, near Mengtsz (says a Consular report) reached a record in 1912, but there is every possibility of a much greater export in 1913 and succeeding years. Eight thousand two hundred tons passed through the Mengtsz Customs in 1912, as against 6,600 tons in 1911. The erection of the modern smelting and fining plant bought from a German firmisre nearing completion, and it is hoped that it will be possible to commence operations in May. So far, the tin exported has been refined by primitive native methods only. It is supposed that there was a surplus of tin held over in 1911, owing to the rising market, which caused the merchants to hold back their supply in anticipation of higher prices in 1912. Their speculation was justified, as the average price at Mengtsz in 1911 of $92 (£8 1s.) per picul (133 ⅓ lb.) rose in 1912 to $102 (£10 4s.). The tin trade, in spite of the repeated efforts of numerous foreign firms to get into touch with the market, is entirely in the hands of the Chinese merchants of Mengtsz and Kochiu, who combine to keep all foreign interests at arm's length. It is understood that the bulk of the tin is exported to Hongkong, where it passes into the hands of a German firm, for shipment to London.

Kailan Mining Administration.—The total output of the Administration's mines for the week ended August 9 amounted to 37,672.53 tons and the sales during the same period to 39,300.17 tons.

For the week ended August 16 the output was 38,455.55 tons and the sales during the same period to 32,504.71 tons.

PERSONAL

Baron von Seckendorff, acting German Minister, was received on August 12 by President Yuan Shih-kai.

Congressman Francis Burton Harrison has been appointed Governor-General of the Philippine Islands in succession to Mr. Forbes.

It is with extreme regret that we record the death of Mr. Frank R. White, Director of Education in the Philippines, which occurred on August 18.

Mr. R. C. Morton, who succeeded Mr. W. W. Campbell as manager of the Kobe branch of the P. M. S. S. Company, will take charge of the Co.'s office at Hongkong.

Mr. Gifford Jones, superintendent of the Cebu division of the Philippine Railway Company, has resigned to take up a position in Mexico. Mr. H. A. Glover has been appointed superintendent of the Cebu division.

President Yuan has decorated Colonel Brissaud, his military counsellor, with the 3rd class of the Golden Corn; M. de Margerie, ex-French Minister to China, with the 2nd class; and M.M. Picot and Piry with the 3rd class of the same order.

OIL

The Kerosene Oil Industry.—The Osaka *Mainichi* says rumours are in circulation that the Rising Sun Petroleum Company has approached the Hoden Kerosene Oil Company with a view to buying up kerosene oil refined by the Japanese Company and selling it in the Oriental markets under their own trade marks. The explanation given is that the demand for kerosene oil at home has greatly increased lately owing to the use of oil as fuel for warships and, consequently, it is reported that the Company sees that ultimately it will not be able to supply the market in the Orient from its own wells. The foreign Company therefore is now in danger of losing markets which it has built up in the Far East in the course of years. The Hoden Kerosene Oil Company, which has lately increased its output daily by 600 koku (one koku about 4 gallons), thanks to the employment of more up-to-date methods, would have willingly accepted the offer of the Rising Sun Company, rather than store unrefined oil produced in excess of the demand, had not they anticipated disputes between the two companies over their respective trade marks. Under these circumstances, the Japanese concern has not yet given an answer, and the negotiations remain unsettled. Owing to the employment of a new method of boring, the output of oil has been greatly increased since last year, but even now the output does not exceed one-half of the total consumption of this country. If the increased output of kerosene goes on at the same rate as during the past year, Japan may be able in time to check the import of foreign oil and produce enough to meet her own requirements. But it is still premature to think of this, as Japanese oil refiners have much leeway to make up before they can expect to beat foreign importers. Such being the case it will be difficult for them, for the present, to find a market for the increased output of kerosene oil, seeing that the yield is increasing so much.

OTARU LUMBER MILL COMPANY

The Otaru Lumber Mill Company was to hold an extraordinary meeting of shareholders on Aug. 30th in the Tokyo Geographical Society's building, Kyobashi, when a proposal to wind up the company was to be considered.

The mill is the oldest of its kind in Japan and has enjoyed an extensive business both at home and abroad. Of late the protracted hard times have caused the profitable realization of the company's holdings to be difficult so that heavy losses have been sustained during the past twelve business terms, the loss for last term alone amounted to 117,000 *yen*. No stone has been left unturned to restore the business of the company to its former prosperous state, but now it is thought advisable to wind up the concern.

The British Engineers Association

London Office, Caxton House, Westminster.

Peking office to be opened on 1st August at the house recently occupied by Messrs. Wardroper and Co., in the

Wang Fu Ching Ta Chieh.

Enquiries to be addressed to:—

Capt. T. C. FitzHugh, M. V. O.

Chief Commissioner.

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THE FAR EASTERN REVIEW

COMMERCE :-: ENGINEERING :-: FINANCE

VOL. X. SHANGHAI AND MANILA, SEPTEMBER 1913 No. 4

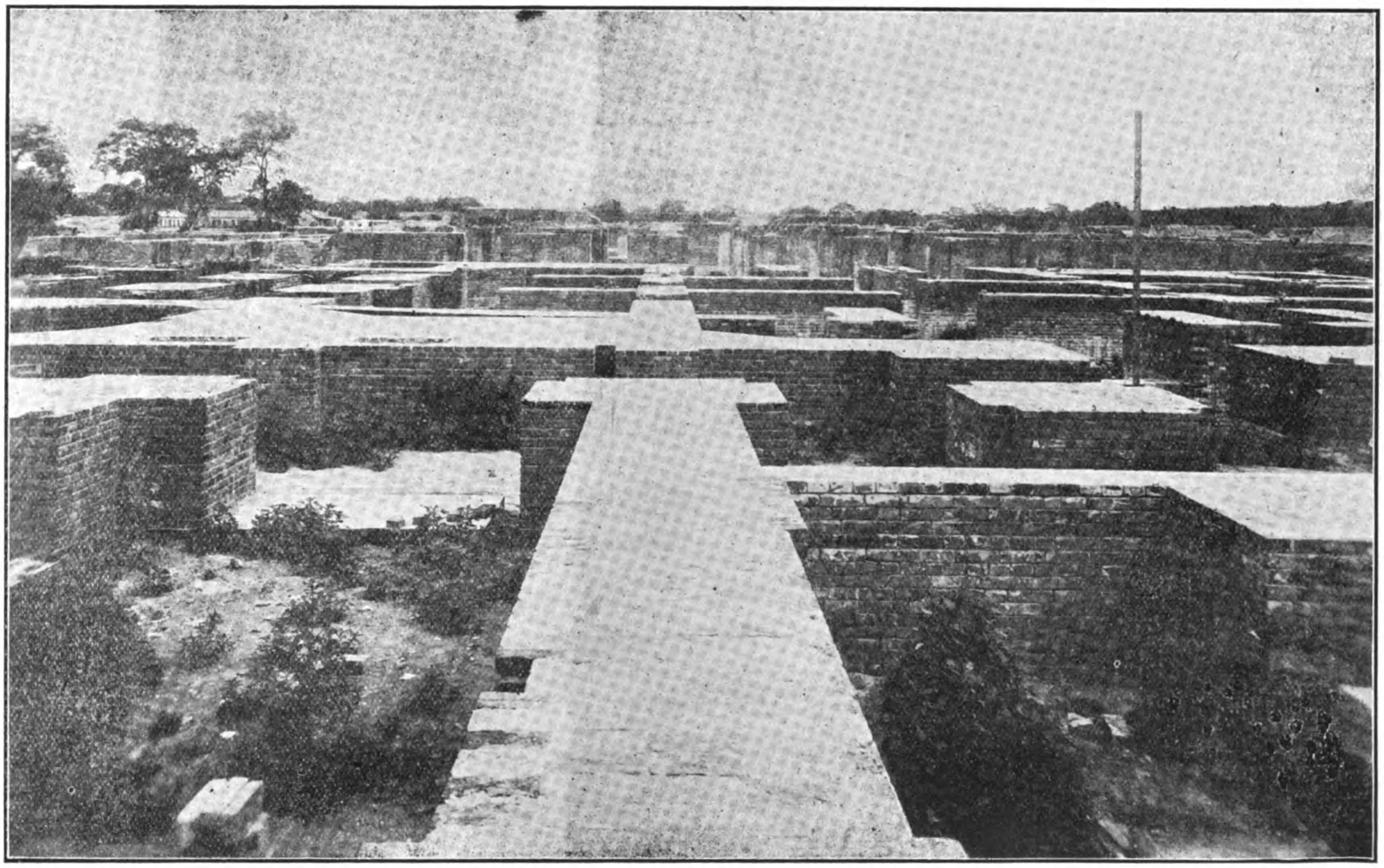
PROPOSED PARLIAMENT BUILDING AT PEKING

On a plot of land some seven hundred by two thousand feet square—the site of the old Examination Halls—situated in the south-east corner of the Tartar City of Peking a large amount of work has been done on foundations designed for a magnificent pile of buildings to serve as the National Houses of Parliament.

The Revolution of 1911-12 stopped construction work completely, and, for financial reasons, all efforts of architect and builders to obtain permission from the Republican Government to resume operations have failed to awaken favorable response.

It is significant that the design was made at the instigation of, and work was commenced by, the reactionary Manchu *régime* and that it has been suspended—perhaps with reluctance—by the progressive Republicans. The claim now is, however, that the Government will shortly instruct that the work be carried to completion. In such an event China will have one of the finest Parliamentary buildings in the world. The design provides for most modern equipment in every respect, and great care has been devoted by the architect to the minutest details.

By reference to the illustration accompanying this article it will be seen that the architecture is of the modern classical order; the treatment providing a most æsthetic, compact, well-balanced,



Foundations of New Parliament Building, Peking

Photo by Le Munyon, Peking

and practical edifice. Legislative Chambers, ministerial, committee, and party rooms, offices, refreshment halls, and other essential subsidiary accommodation are contained beneath the one roof and so arranged as to give the greatest service with the maximum of comfort and utility and the minimum of waste space and loss of time in communication.

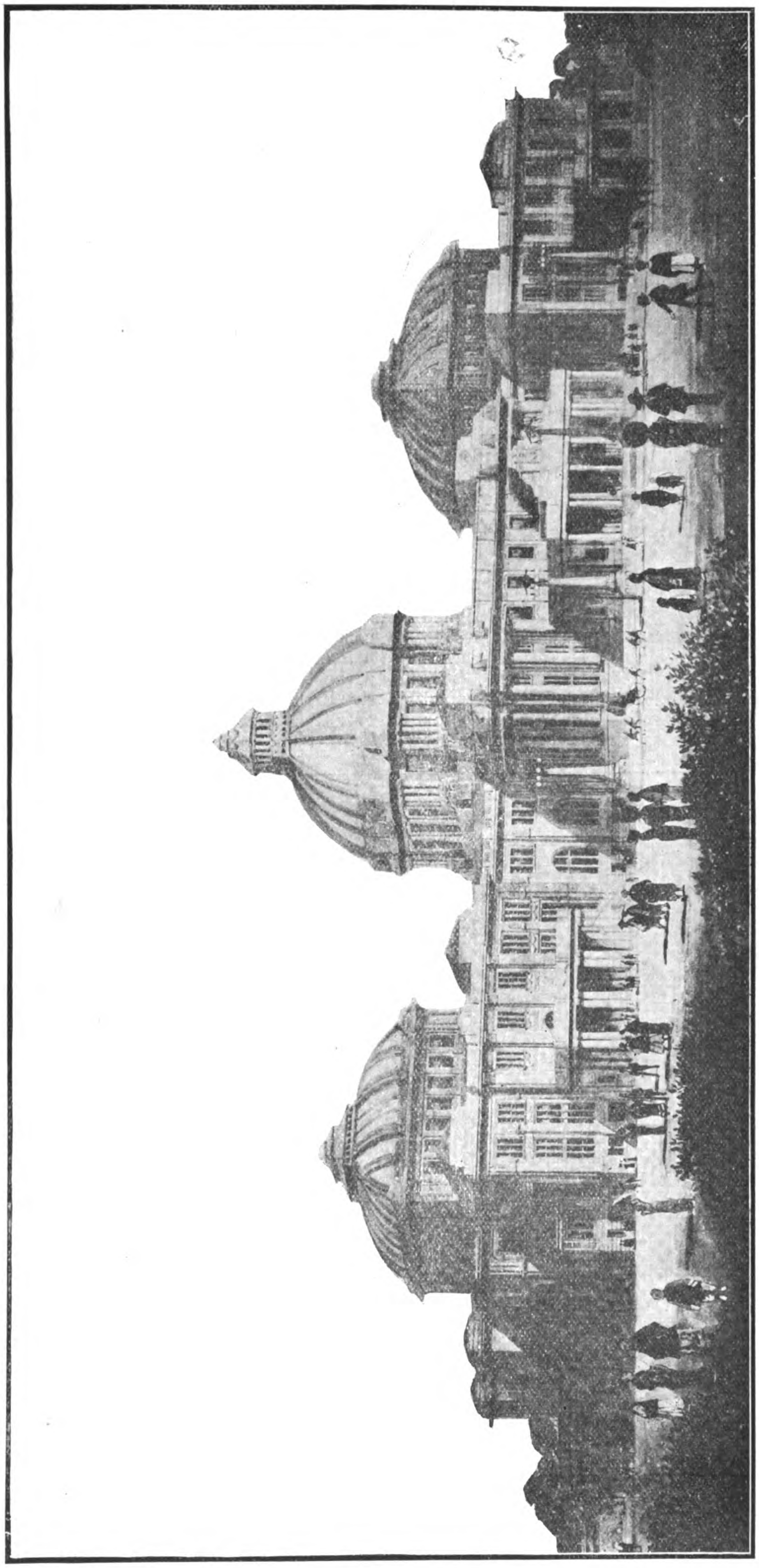
What is it that the architect hopes the coming generations of Chinese will see as the seat of their legislative activities? Entering through massive and distinctive gateways, the spectator will observe before him an impressive structure of four storeys in stone and reinforced concrete made striking by stately columns and three surmounting cupolas, the central one dominating and affixing the seal of solidity established in the design of the walls. The small cupolas rise immediately over the Senate and House of Representatives respectively, and it will be observed that the design is such that the sections of the building to the right and left of the central division—which is devoted to the main entrance and marked by the great dome and large portico—are identical, their similarity being also carried out in the interior arrangements.

A carriage drive will lead to the main entrance by a ramp ascending beneath a handsome portico, when the visitor will, by two flights of seven steps each, reach the main entrance hall. A striking array of seventy-two marble columns, arranged in groups of four, will support the decorated ceiling. On either side lifts and stairways will give communication with the floors above, while accommodation will be provided in the immediate vicinity for members' cloaks and for the House attendants.

Another flight of seven steps will communicate with the large reception room, capable of seating 1,200 people. Octagonal in shape, illuminated by an artistically designed lead-light ceiling 60 feet high, with decorated walls and with a symmetrical sweep of pillars and arches, it will be a beautiful hall. In the centre will be a large platform reached by seven steps, for high officials attending any function, while three more steps will lead to a higher dais, where the President will sit on important State occasions. Directly to the rear of this platform will be a retreat for the President, leading to the President's private apartments or the great stairway hall 45 feet by 24 feet, at the back of the building, where will be provided a private entrance for the President and Ministers.

On three sides of the reception hall above referred to will be a gallery capable of seating 350 visitors. It will be in this hall that openings of Parliament will take place, in which case the gallery will be for the accommodation of the visiting public.

This chamber will be immediately beneath the central dome, and will obtain its light therefrom. Round the outside



The Future Home of China's Parliament. When completed this will rank among the finest Parliament Buildings in any part of the world

of the chamber will extend a corridor fifteen feet in width, decorated with columns, whence communication will be secured with the Senate on the right and the House of Representatives on the left.

A special front entrance to each House will be provided, which is indicated on the illustration by the small porticos to the left and right of the main entrance. Each Chamber will be 85 feet in length by 70 feet in depth, and may be reached by way of special entrance hall, equipped with stairways and lifts. The architect has so designed these sections of the building that members of parliament, and officials, will have absolute immunity from public interference. From the main entrance hall a broad stairway will lead to the first floor and corridor round the Chambers. Three doorways on each side of this hall will give access to members, while officials will have private entrances at each end of the building. The public may only enter the gallery of the Chamber by taking a stairway or lift which will be specially provided in the basement. Near each Chamber rooms will be provided for the President of the House and the staff, while seven rooms will also be arranged near each Chamber for Ministers and high officials, with private entrances to the Chambers.

A hall 36 feet wide and 66 feet long will extend from one Chamber to the other, which will also give access to the refreshment rooms, lavatories, etc.

Each Chamber will be provided with semi-circular seating accommodation, the Senate facing the North and the House of Representatives the South. The furniture for these legislative halls will be of most modern description and in keeping with the general decorative style adopted throughout.

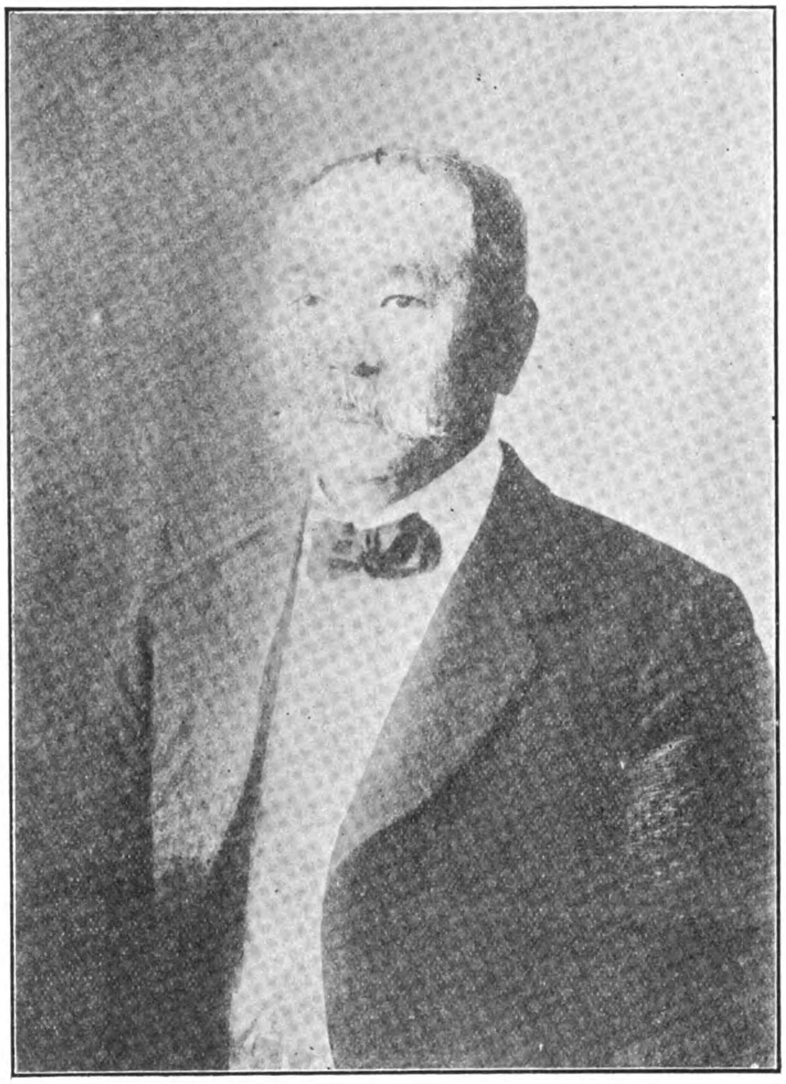
The second floor will provide entrance to the galleries of the Chambers, press rooms, waiting rooms, refreshment room for strangers and lavatories. A feature of the press rooms will be the special telephone and telegraphic installations.

On the third floor Committee and party rooms providing considerable accommodation will be arranged, while at the rear of the central dome the library will be established, with reading and writing rooms on each side for the members of the two Houses. The members' telephone and telegraph rooms will also be provided on this floor at convenient places.

The staff of attendants will be accommodated in the attic rooms.

Altogether there will be 28 staircases, most of them leading from the basement up to the various floors through the walls. These have been so contrived as to prevent confusion, and will assure the utmost possible privacy for members and officials. The stairways for the public will lead to nowhere but those places in the Houses where the public will be admitted.

Special attention will be given to the installation of lighting and heating plants; the latter will be so arranged as to permit of sections of the building being heated either by hot air or water without a waste of heat in unoccupied portions.



Dr. S. Hirai, Chief Adviser to the Chinese Board of Communications

The most up-to-date sanitary equipment will also be provided, and the kitchens, in the basement, will be equipped with the best available cooking arrangements. All pantries will be connected by special food lifts running to the refreshment rooms and upper floor.

The foundations of the building will be of concrete twelve feet in depth, and the same material, reinforced, will be used throughout the building, especially in the roof and cupolas. The basement will be of granite, obtainable at the western hills, whence will also come whatever sandstone or marble that is used.

The design of the building has been made by Dr. C. Rothkegel, who was assisted by eight European and five Chinese architects and draughtsmen in working up the innumerable plans. The minutest care has been taken to obtain a final assemblage of material without miscalculation, and the work devoted to this important part of the scheme has been painstaking and tedious, reflecting the highest credit upon the architect and those assisting him. Details for every portion of the great building have been prepared, and the architect awaits nothing but the money to commence work and carry it on to speedy conclusion.

CHIEF RAILWAY ADVISER TO CHINA

In regard to Dr. Seijiro Hirai, Railway Technical Adviser to China, the special commissioner in the East of *The Engineer* wrote at the time of Dr. Hirai's appointment as follows:—

Dr. Hirai was born in 1855. He was sent by the Japan Government to study engineering at Troy, U.S.A., in 1875, and there obtained his engineering degree. He returned to Japan in 1880 and filled the position of chief engineer to the Tanko Railway till 1894, when he became attached to the Imperial Government Railways. He steadily rose to the position of President of the Imperial Railways; this was before the creation of the Railway Board. On the creation of the Board he became Vice-President, which position he filled till quite recently.

When I was in China there was a great deal of speculation about this position, as it was well known that the government contemplated such an appointment. No one, however, had any idea that anyone outside the present circle of Chinese railwaymen would be selected, and it will come as a surprise that a Japanese engineer has been appointed.

Of Dr. Hirai's experience and ability as an engineer there can be no doubt. He is held in the highest respect by the officials and men of the Japanese Railways, and that his country honours him is proved by the fact that he is one of the non-hereditary members of the house of peers. He has a personal charm which cannot fail to make him popular.

Nationality counts for a great deal among foreigners in China. Personally, I confess that I am sorry a Briton was not selected for this position, and others will doubtless be sorry that a Frenchman or a German or an American did not receive the appointment. The one thing that should unite railwaymen to support Dr. Hirai is that he is by ability, training, and experience an engineer worthy of the position.

Dr. Hirai will be well advised if he declines to join in the insane movement to rid the Chinese Railways of their best friends, the foreign engineer and manager. The experience of his own country in this matter should make him careful, for, but for the undue haste in filling responsible positions with Japanese subjects—experienced and able or otherwise, it little matters—Japan would to-day have been supporting a large industrial community as the result of the investment of foreign capital.

SINGAPORE HARBOUR IMPROVEMENTS

RECLAMATION AND BOAT HARBOUR

The extensive harbour works to the west in Keppel Harbour, the wharves and the Lagoon Dock, have recently been described, and public attention has been drawn to them, says the *Singapore Free Press*, and continues :—The eastern works, those in the Roads, while perhaps more "in the public eye" literally, are less understood and their extent and future influence on the domestic commerce of Singapore are less appreciated.

Two distinct works are going on in the Roads. In the first place Pulau Obin is being transported to the Roads and put down in the shape of a Mole, to form a safe and protected inner harbour, where local vessels can anchor and load and discharge into tongkangs, secure from the disturbance of China Sea rollers, or the equally troublesomes rough water resulting from a strong S. W. wind or local storm. The only point of the history of the long controversy as to the necessity of these works that need be touched on, is the persisting fact that Singapore River is utterly inadequate and unsuitable for the large tongkang traffic that is needed for our trade. Therefore provision has to be made otherwise. The Mole is to shelter the ships and tongkangs while loading and discharging; the Reclamation and Tongkang Harbour is to land and embark goods from the Mole.

The Mole.

This protective work has probably come in for more criticism than any other of our harbour works. It is 5,000 feet long, and at present looks very unfinished and irregular. Yet we are assured that the Mole is steadily approaching stability. The quantity of stone originally estimated to be required for the final completion is not likely to be exceeded, and settlements of the kind which have long been obvious to all observers, were fully anticipated and allowed for in the original estimates. The settlements are not abnormal, and the work is steadily progressing towards completion. For motives of economy it will remain an unfaced Mole.

The more important question of the effect of the Mole in carrying on harbour work has two aspects—does it protect ships at work? has it improved the anchorage? There can be no two opinions about that in the inner harbour. This also, in connection with the dredging of the Inner Harbour, is important. Altogether about one and a third million tons have been dredged from the floor of the harbour, and gossip to the contrary notwithstanding, the depths over the dredged areas have been well maintained. This part of the work is nearing completion.

The Reclamation and Boat Harbour.

The original scheme for the Teluk Ayer Reclamation (the second, the former one being completed in 1894) was the construction of a sea wall from Johnston's Pier to Malay Point and the reclamation of this land, so that local ships up to eighteen feet might come alongside the wall and work their cargoes. In 1911, owing to the enormous depth of mud overlying the hard bottom, it was found impossible to complete the Telok Ayer Wall at any reasonable cost, and there was substituted for the full reclamation a Tidal Basin Scheme, which it is hoped to have completed by the end of next year.

The scheme provides for the omission of 900 feet of the originally designed wall, and the formation of a basin for small craft. This tidal basin will have an area of 22 acres, only slightly smaller than the Lagoon Dock at Tanjong Pagar, and will be dredged, say to seven feet at low water, permitting of the use of this area by boat and tongkang traffic of the Singapore River type.

The Sea Walls

As has been said, the original scheme was a sea wall based on sunk concrete cylinders, dry land on the one side, sea on the other. But it was soon found that the concrete cylinders had to be sunk to an enormous depth before they entered the solid, and, where the old stream at Teluk Ayer debouched, no bottom was to be found at a practicable depth. The revised plan is, at the ends where the better foundation is, a double wall of cylinders tied together with steel rods and the intervening space filled in. There is thus the composite wall substituted for the single wall. Away from the shore ends an ingenious system of wall and superstructure takes its place. The wall is there, and on the inner face are two further rows of cylinders, between which and the wall reinforced concrete trusses support a superstructure 85 feet wide. If one could see it above ground it is a wall, with cloisters, both resting on concrete pillars. In the cloisters the sea water will flow freely from the inside. The original wall would have had the strain of 30 feet of earth on one side and eighteen feet of water on the other. The new wall has still the 18 feet outside, but inside there is twelve or thirteen feet of earth, and five or six of water.

The Northern Pier, 560 feet long on its inner face, is clearly seen from Johnston's Pier and Collyer Quay, and is practically finished. One has, however, to walk on the 85 feet wide Quay to thoroughly appreciate the magnitude of the work. Or better still, climb down and peer under the floor of the superstructure.

The Southern Pier is 1,360 feet in length and is almost complete as far as its cylinder foundations go, and the superstructure is now in hand.

The process of construction is exceedingly interesting, especially if one has, as our representative had, at hand, some one well acquainted with the work to explain the process of putting in the temporary structure to form the mould of the reinforced concrete, to tell how the steel bars and moulds are arranged, and the devices to overcome difficulties.

The ends of these two piers are finished. When the remainder is completed, the basin will be dredged out, and the inner walls probably stepped to facilitate boat and tongkang work. On the 66 acres of land—which will take all that remains of Mount Palmer to make—godowns should be erected, each with a line of rails connected with the railways on the sea walls, and with the Tanjong Pagar system.

Thus from ship to sea wall direct; or from ship to tongkang to be taken over the tidal basin to the godown steps; into the train and down to Tanjong Pagar for transhipment, or for rail carriage to the Peninsula! Compare this with the delays of the Singapore River traffic! And the tidal basin will furnish, on one side the 2,000 ft. of sea wall; on the other over 3,000 feet of stepped Quay—say as much as there is in Singapore River up to beyond Elgin Bridge. With no bridges or currents or bad tides to interrupt the work!

The Engineers of the works, Messrs. Coode, Matthews, Fitzmaurice and Wilson of London, are represented locally by their partner, Mr. Leigh Matthews, while Mr. R. M. Lewis is Resident Engineer.

The contractors, Sir John Jackson, Ltd, and their staff are to be congratulated on having so far "made good." An organisation and attention to detail which not many in Singapore realise has been devoted to the work, and Mr. Wilkinson, Mr. Axten and their colleagues have reason to be proud of the success that has followed on their efforts.

KING'S DOCK, SINGAPORE

On August 28 the Governor of the Straits Settlements, Sir Arthur Young, formally opened the new Graving Dock of the Singapore Harbour Boards, and named it King's Dock. From the *Singapore Free Press* we learn that in asking the Governor to open the Dock the Chairman of the Board, Mr. J.R. Nicholson, C.M.G., said *inter alia*:—"We may repeat the remarks of our predecessors by saying that in this dock we have provided a dock which is likely to meet the requirements of the port for many years to come, in fact, we can dock any ship afloat. The "Imperator" is a few feet longer but were she to honour us with a visit, we would express our welcome by spoiling the beautiful symmetry of the north end of the dock by removing a few feet of concrete and thereby give her a comfortable berth. There is only one dock in the world materially larger than this—that lately opened by His Majesty the King at Liverpool, the Gladstone Dock, but that is not purely and simply a graving dock ; for the sake of economy it is constructed with cargo warehouses along one side, so that when not being used to dock vessels for repairs, the dock may be usefully employed in discharging cargo. I don't want this remark to be an egg which may hatch out in the fertile brain of some one into the idea "Why not use the dock to discharge coal, there is plenty of room?" So there is and I hope the time will not be far distant when there will be a large business in coal done with in close proximity to this dock, but not by means of the dock. To give you some idea of the size of this dock; its construction has taken four years and a half and cost $3,696,679; it contains 121,000 cubic yards concrete or practically 200,000 tons, the amount of cement used was 21,000 tons, a figure which perhaps does not convey to you so definite a meaning as say barrels: if all the barrels used were placed end on they would reach 51 miles. The dock contains 22¼ million gallons of water when full and is emptied by two large centrifugal pumps each driven by a surface compound engine, each engine developing 1,000 H.P. The draining pumps are electrically driven. The pumping power is capable of emptying the dock in two hours which gives the quantity of water being pumped as 187,500 gallons per minute or 836 tons per minute. On behalf of the Board and Engineers I should like to express our appreciation of the magnificent work Messrs Topham Jones and Railton have given us, and also to convey to Mr. Taylor, the local director of Messrs. Topham Jones and Railton, our indebtedness to him for the courteous and fair minded way he has invariably displayed throughout the conduct of this work."

Description of the Dock

The King's Dock which has just been completed in Singapore for the Singapore Harbour Board at a cost of over £400,000 is the largest dry dock in the Far East and will add very materially to the facilities of the Board for docking work.

The dock is 879 feet in length by 128 feet in breadth, with an entrance width of 100 feet; it can, however, be divided by a central caisson into an inner and outer portion which can then dock ships of 502 feet and 346 feet in length respectively. The depth over the outer cill is 34 feet at high water spring tides and 24 at extreme low water; the inner cill is dropped lower so as to admit of sufficient working space under the bottom of any ship which may be long enough to reach over the central division.

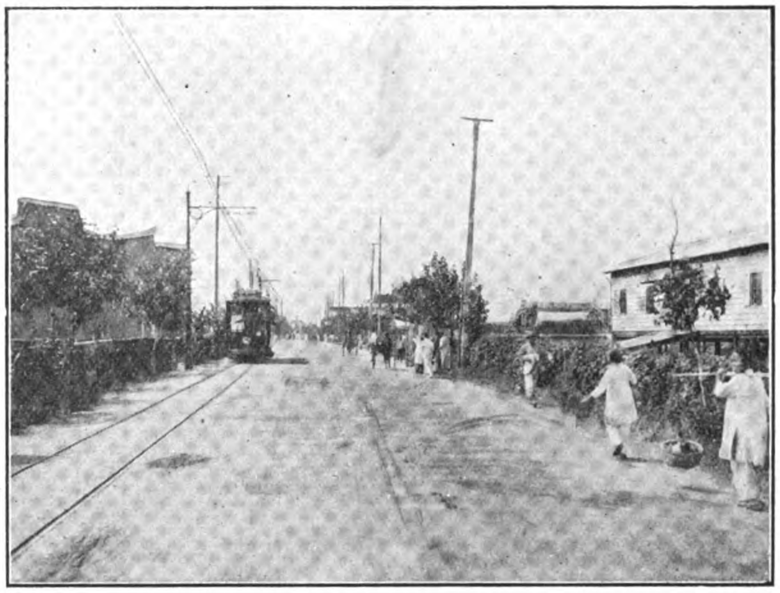
The dock is constructed entirely of concrete, with the exception of the two entrances which

(*Continued on page 128*)

THE NANTAO (SHANGHAI) TRAMWAY

THE FIRST CHINESE TRAMWAY IN CHINA

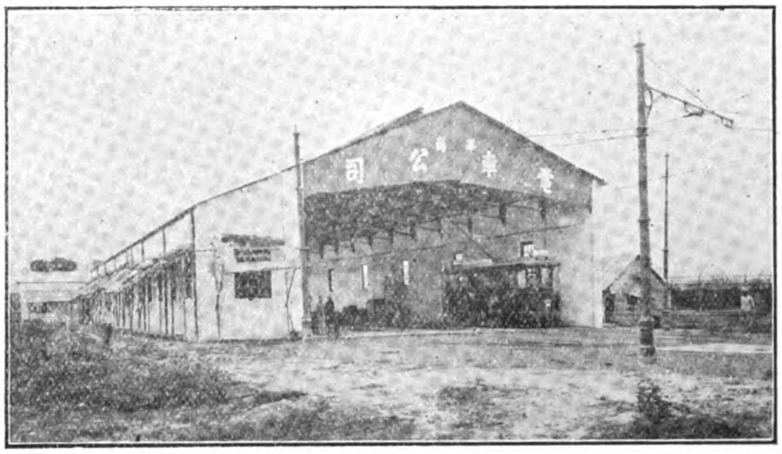
NANTAO TRAMWAY.—Mr. Lo Pah-hong, who formed the Nantao Tramway Company



NANTAO TRAMWAY.—Near the Shanghai-Hangchow Railway Station

On August 11 last the Nantao Tramway Company formally began its service. The occasion is particularly noteworthy, inasmuch as this is the first tramway in China which has been financed, built and managed by Chinese. The only foreign assistance was that given by Mr. E. Kocher of Messrs. Siemens China Electrical Engineering Company, who supervised the work and retains the position of consulting engineer to the Company. Apart from Mr. Kocher the enterprise has been entirely carried through by the Chinese themselves.

The Nantao Tramway Company was formed in April, 1912, mainly as a consequence of the efforts of Mr. Lo Pah-hong, who was the prime mover in the whole affair. Mr. Lo Pah-hong obtained the consent of the authorities and succeeded in interesting several of the rich Chinese residing in Nantao. As a result the Nantao Tramway Company was formed with a capital of about Tls. 200,000.



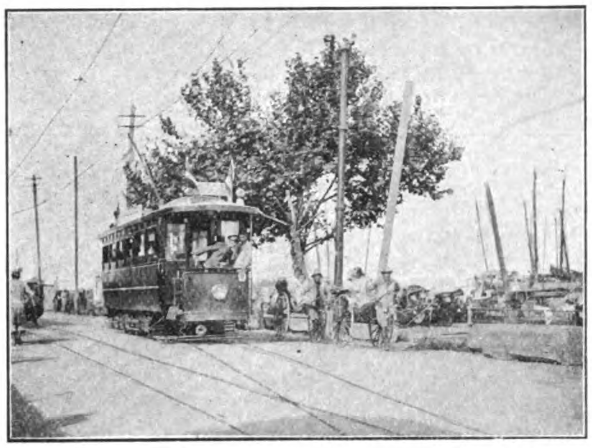
NANTAO TRAMWAY.—The Carshed

The line starts from the Marché de l'Est (in Chinese Chilopu) and runs along the Chinese Bund to the south end of the Bund. From the Marché de l'Est to Tungkadoo there is a double track. From Tungkadoo to the Shanghai-Hangchow Railway Station—the present terminus of the line—there is a single track with loops every 400 metres. The length of the line between Marché de l'Est and the Shanghai-Hangchow Railway Station is about 2½ miles, and the proposed extension to the Arsenal is about three quarters of a mile. There are about 32 curves in the whole line, and the rails were sent out from Germany bent into the shape required.

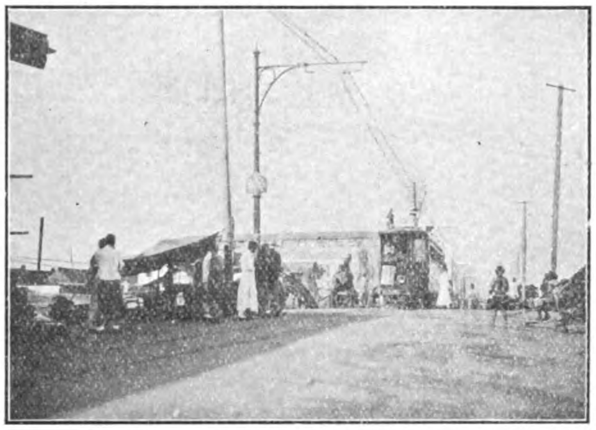
The material, rails, cars, etc., were ordered in May last year, but the rails did not arrive until March

NANTAO TRAMWAY.—Terminus Marché de l'Est

NANTAO TRAMWAY.—Mr. H. Kocher, under whose supervision the line was built



Nantao Tramway.—The Chinese Bund



Nantao Tramway.—Bridge near south end of the Chinese Bund

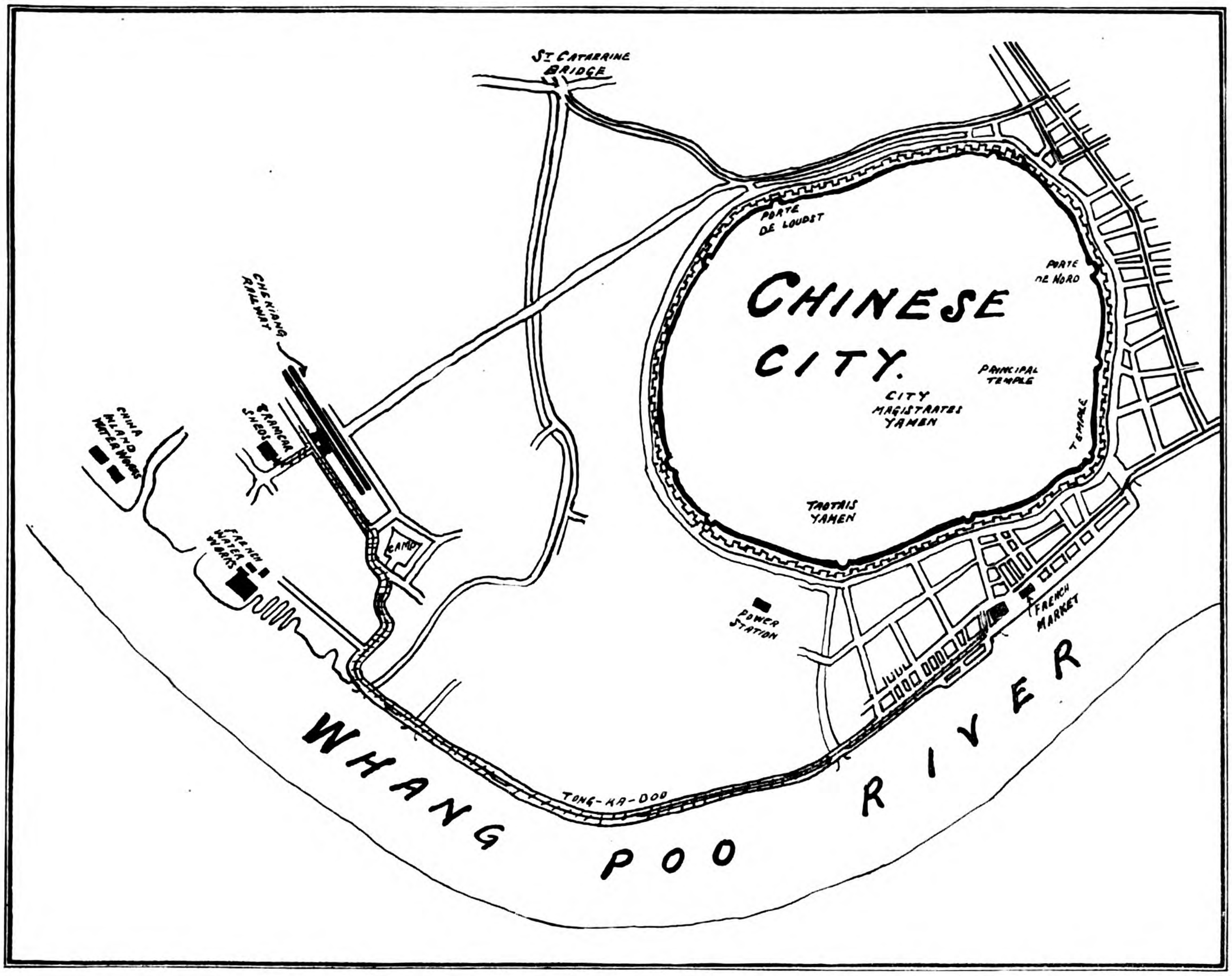
this year. The delay was occasioned by a fire breaking out on the steamer conveying the rails, while in the Mediterranean, and as a result the vessel was compelled to return to Hamburg Owing to the delay thus caused the work could not be started until March, but it was finished by the end of June. It may be mentioned that the line had to be surveyed by Mr. Kocher before the order for the rails could be sent, and this work occupied some weeks.

A trial run was made at the beginning of July, but the outbreak of rebellion, attended by protracted hostilities in the locality traversed by the line, prevented the formal opening of the service. The car shed, it may be mentioned, was damaged during the fighting.

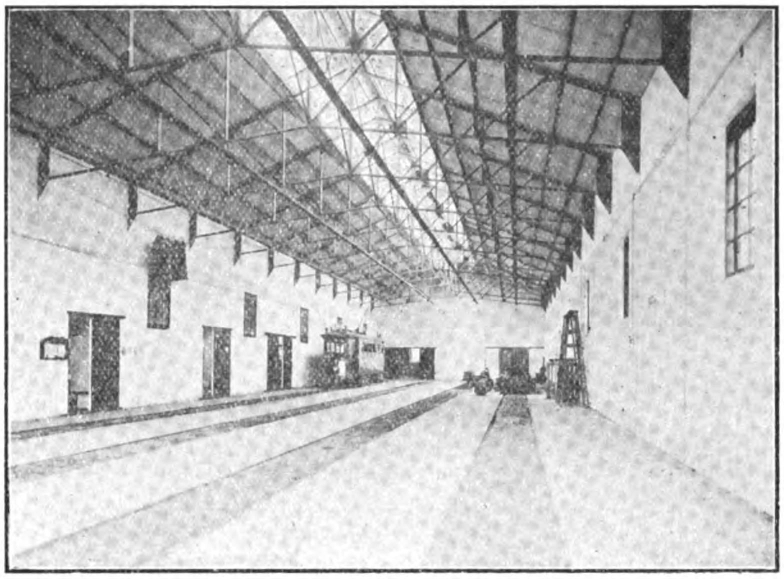
However, by August 11 conditions around Shanghai had improved to such an extent that the Company felt justified in formally starting the regular service.

The Rails.

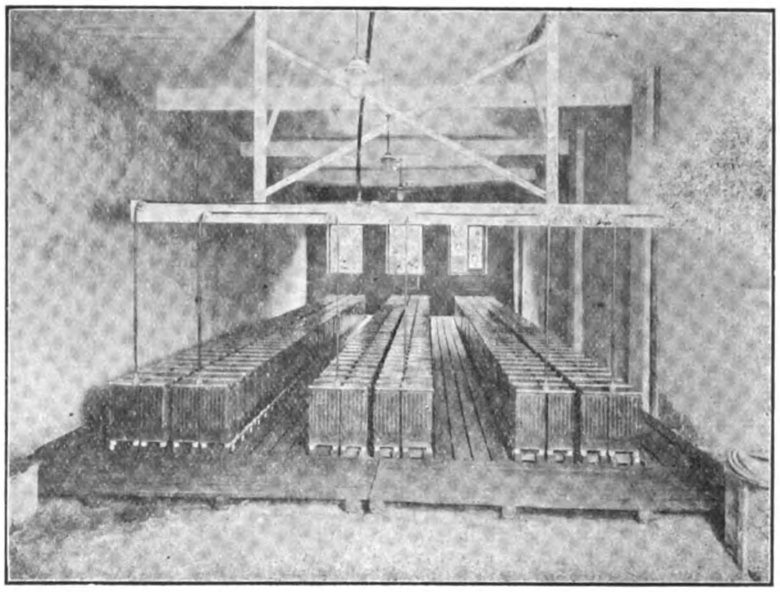
The rails were imported from Germany and were supplied by the Gutehoffnungshütte. They are fairly heavy rails of about 100 kilos per metre. The foundation for the rails was formed by digging a trench 500 m/m by 300 m/m, placing in the bottom large stones with pyramid points upwards, and over this placing smaller stones and gravel, well stamped down. This method of forming the foundation for



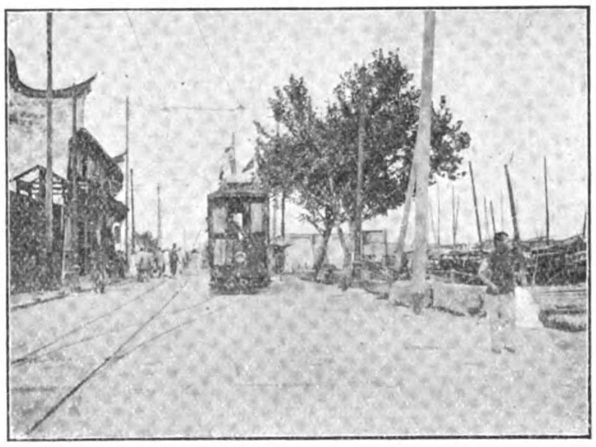
Map showing the Nantao Tramway Line. It begins opposite the French Market and along the Bund to the Sheds opposite the Shanghai-Hangchow Railway Terminus



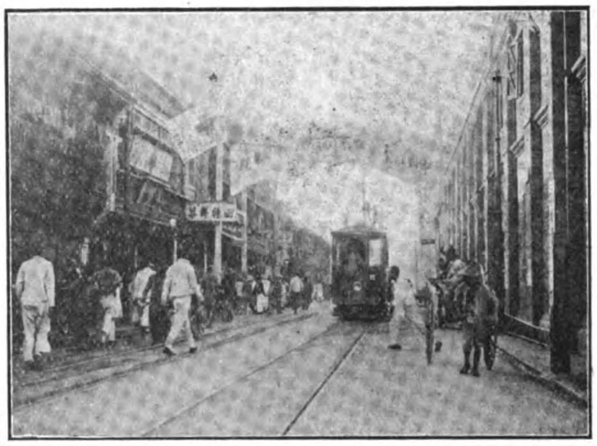
NANTAO TRAMWAY.—Interior View of Carshed



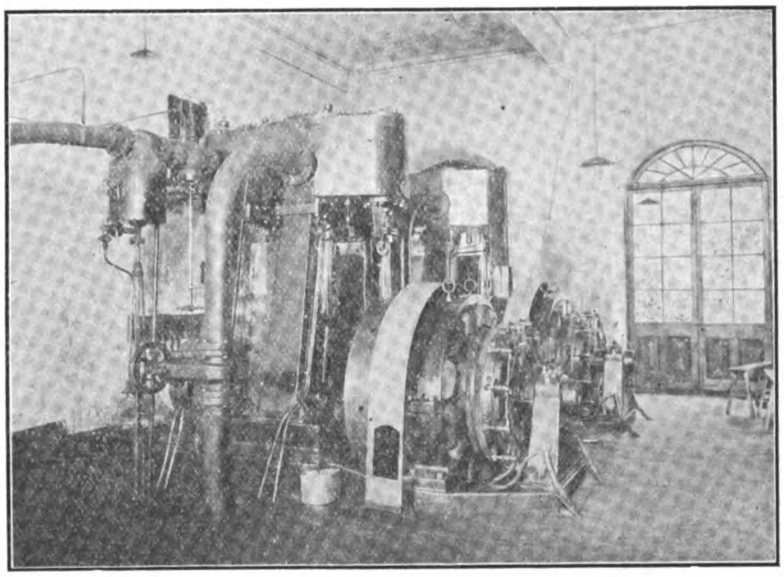
NANTAO TRAMWAY.—Accumulator Battery



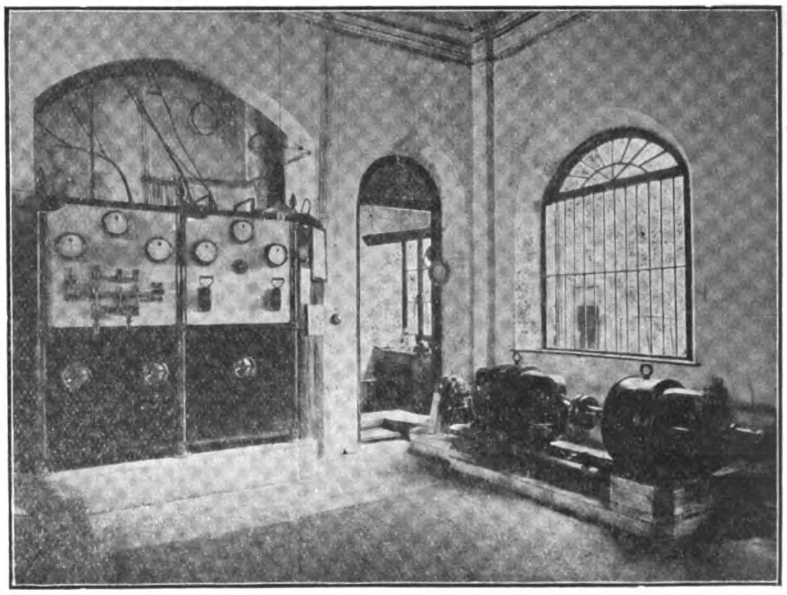
NANTAO TRAMWAY.—Loop at Tongkadoo



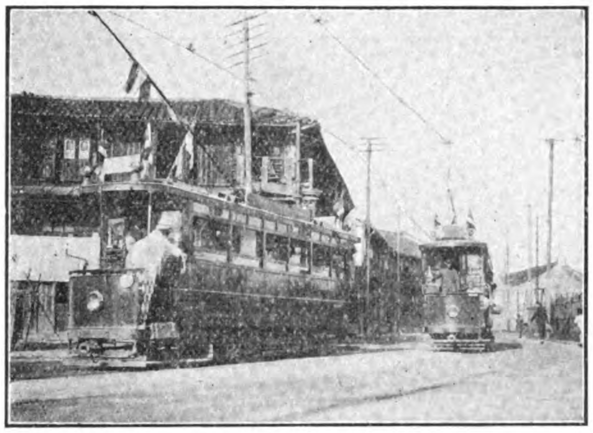
NANTAO TRAMWAY.—Street near the Marché de l'Est



NANTAO TRAMWAY.—Steam Engines and Dynamos



NANTAO TRAMWAY.—Booster and Switchboard

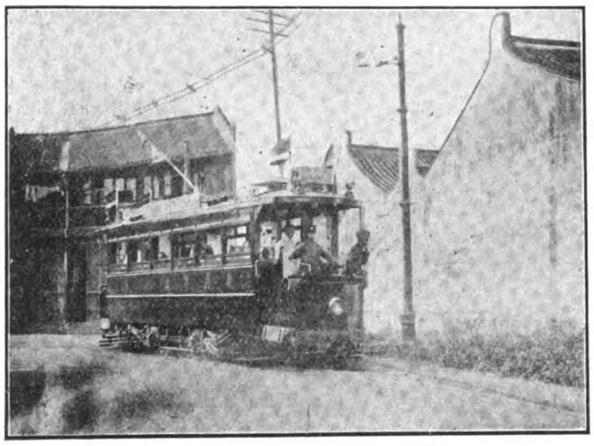


NANTAO TRAMWAY.—Another Loop

the rails enables surface water to drain away, while providing for stability and rigidity. Each rail-joint is placed on a plate of reinforced concrete. The switches are made with two tongues as on railway tracks, a provision which lessens the shock to the passenger. Although the track was laid as before mentioned, to the Shanghai-Hangchow Railway Station, already an extension to the Arsenal has been ordered, and the work on this part of the tramway will be started in a few months.

THE TROLLEY WIRES.

For the overhead line there were employed two trolley wires of hard drawn copper of a cross section of about 55 square millimetres. The trolley wire is supported by insulators suspended to steel wires, which are fastened, on the double track portion, to steel poles, and on the single track part are attached to brackets. About 900 metres from the Marché de l'Est the feeders are connected with the overhead wire going from the Power House, which is situated near the city wall. All the parts for the overhead line as well as for the



NANTAO TRAMWAY.—Turnout near Military Camp

car trucks came from Siemen's Bros. Dynamo Works in England.

THE CARS

The trucks for the cars were furnished by the United Electric Car Co., Ltd., of Preston, England. They are similar in character to those used in the trams in the Settlements. The motors, controllers and all the electrical equipment for the cars were furnished by Siemen's Bros. Dynamo Works.

The motors are designed for a maximum speed of 20 kilometres an hour (about 12 miles an hour), but the average speed will not be more than sufficient to cover the whole distance between the Marché de l'Est and the Shanghai-Hangchow Railway Station in twenty minutes.

There are first and second class cars, as is the case with the French Tramway Company in the French Concession, and the car bodies are about the same. These were made locally by the Yur Sing Factory (Nicholas Tsu).

THROUGH RUNNING.

With an eye to the future, the gauge and the height of the trolley wire were made similar to what has been adopted in the French Concession and the International Settlement. This will render it easy, when the time comes, to organise a through service. As a matter of fact, arrangements have already been made with the French Tramway Company to link up the systems at the bridge across Fong Pang Creek.

CAR SHED.

The car shed, which has been constructed to afford accommodation to twenty cars, is situated in front of the Shanghai-Hangchow Railway Station. It contains also an office for the traffic manager's department, repair shops, painting shops, store rooms, etc. There is now in course of construction a large office for the managerial and clerical staffs, near the shed. The ground for the car shed is sufficiently large for the construction of another shed of similar size and a number of other buildings. The car shed is a steel building, and was built by the Yur Sing Factory. The building was designed to give every facility for the efficient maintenance of the cars and is up-to-date in every particular.

THE POWER HOUSE.

The power is supplied by the old Power Station of the Shanghai Inland Electric Light Company. It contains two engines of 100 kilowatts each, which served up to 1910 for the lighting service of this Company. In that year they were taken out of service because a new station near the Arsenal was opened. The engines were overhauled and fitted for the tramway work by adding a storage accumulator battery and booster of the Pirani-Siemens-Schükert system. The battery and the booster prevent the fluctuations of the current taken up by the cars, from influencing the dynamos and steam engines and besides that, the battery can keep the cars going for some time, in case of a breakdown of the steam engine or dynamo.

The dynamos supply a voltage of 550 volts to the trolley wire, and each engine is capable of driving from 18 to 20 tram cars on the speed at which they are run at present.

THE TRAFFIC.

The traffic on the line already largely exceeds the estimates that were made originally, and the cars, especially the second class, are always crowded with passengers. The Company is already considering the advisability of augmenting its material. Moreover a proposal to run a new line round the city along the boulevard which has replaced the old wall, is engaging attention and this work will probably soon be put in hand.

Considering that the Chinese workmen and foremen were not accustomed to that kind of work and that, during the laying of the rails, there were many days of bad weather, it must be said, that the work was carried through in a very short time. This is highly creditable to the Chinese staff.

It is an interesting fact that, in spite of the heavy traffic on the Chinese Bund, up to now, that is in the first month of service, not a single accident has occurred, much to the pleasure of the Chinese authorities and managers, some of whom were afraid that there would be accidents, especially during the early days.

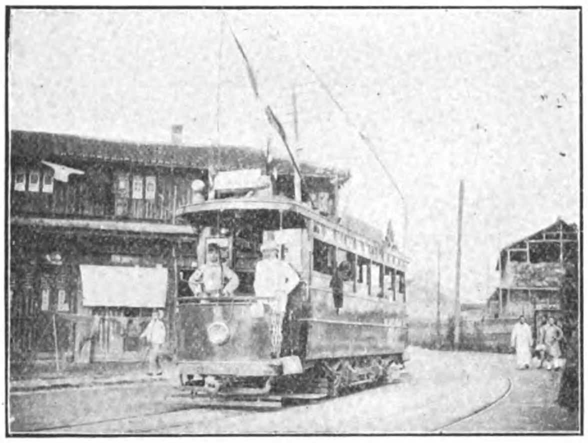
KING'S DOCK, SINGAPORE

(*Continued from page 124*)

are of Cornish granite ashlar. The altars throughout the work are of moulded concrete blocks, the remainder of the facework is worked up with fine concrete masswork. Three rows of granite keel block courses also run throughout the dock under a corresponding number of heavy timber keel blocks, the remainder of the floor is of mass concrete.

Two ships' caissons, built by the Thames Ironworks Company are provided; they are identical in size and are accordingly interchangeable; each weighs 826 tons including ballast.

The dock is filled through two culverts 7 feet high by 4 feet 6 ins. wide and is emptied through two culverts 10 feet by 6 feet leading to the pumping station, where two of Messrs. Gwynnes 60 inch centrifugal pumps are installed. Each of these pumps has two suctions 36 inches in diameter, and is direct coupled to a compound condensing engine of about 1,100



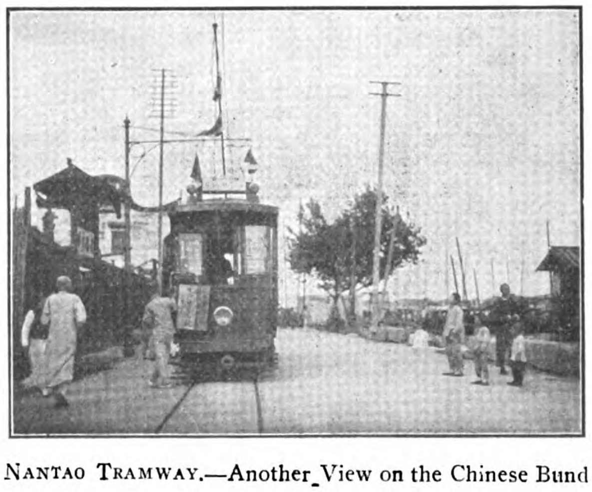
NANTAO TRAMWAY.—A "Turn-out"

I.H.P. with cylinders 24 inch and 46 inch diameter by 24 inches stroke. Steam is supplied to the pumps at 160 lbs pressure by three Babcock and Wilcock boilers each capable of evaporating 12,300 lbs of water per hour.

These pumps are capable of emptying the dock, which contains 22 million gallons of water, in less than 2 hours against a maximum lift of 39 feet.

The dock equipment comprises four 10 ton and eight 5 ton capstans by Messrs. Clark Chapman and Co., a 5 ton crane by Messrs. Babcock and Wilcox, a 15 ton crane by Messrs. Stothert and Pitt and penstocks by Messrs. Glenfield and Kennedy; all of which appliances are operated electrically by power derived from the Board's own power station.

The Engineers for the works are Messrs. Coode, Matthews, Fitzmaurice and Wilson and Mr. J. R. Nicholson, C.M.G., Mr. F. C. Fforde acting as Resident Engineer. The works were carried out under contract by Messrs. Topham Jones and Railton, Ltd., Westminster.



NANTAO TRAMWAY.—Another View on the Chinese Bund

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STARVING CHINA'S RAILWAYS

The optimists in China in 1911-12 had some excuse for believing that the change of government consequent upon the overthrow of the Manchu *régime* would mean a change for the general betterment of the country—a change which would signalize remarkable industrial development, and which would give a long awaited and sorely needed fillip to railway expansion. For some reason or other it was generally believed by foreigners that reform in this direction would be spontaneous and immediate. It has not been. So far even the Government has not assumed definite shape. Politics have played so important a part with the various Boards that progress has been compelled to take a back seat, and declarations of the leaders of the new order that China would forthwith leap into a bold forward movement; would clamor for and welcome foreign assistance and advice; and would widen the avenues for foreign trade and intercourse, have been given the lie almost before the echoes have had time to die down in the distance. This may or may not be intentional. We will join the charitable in attributing the shelving of the good intentions to the desire of patriots for the prior establishment of a good central government, but in doing that we are, to a certain extent, compelled to stand with the jeremiahs and wonder when that desideratum is ever likely to materialise if party feelings and prejudices are much longer to be permitted the pernicious play that has been so far vouchsafed them. Both the Government and the opposition parties are to blame for the deplorable stultification of post-revolution promises and the unhappy conversion of enthusiastic optimists into the most plaintive of pessimists.

The well-wishers of China were particularly optimistic about the future of railways. They felt that they had grounds for legitimate belief that the Government under President Yuan Shih-kai would insist upon a strong forward policy being adopted and followed, but the President has had other things to attend to than the welfare of existing railways, and the Board of Communications has not yet managed to pull itself together to face expenditure for adequate maintenance of lines in operation and the replenishment of depleted equipment, much less the making of a display of enterprise in other directions. The Board has in fact been the milch cow of all other Boards. It is the one earning department in the governmental scheme of things, and the proceeds which do come to its coffers from the various railways are not permitted to remain out of circulation for any length of time. They are quickly requisitioned for general administrative purposes, with the result that the Board is deprived of all chance of benefiting the lines out of earnings, as should be done, and is provided with an excuse behind which to hide from the clamors of those who are constantly crying for more rolling stock to deal with the transport of the increasing quantity of cargo that is being offered. Every line in operation in China is underequipped, and the lack of transportation facilities is causing a serious loss to the revenues of the State. On the short line from the Kailan mines an augmentation of traffic by some two thousand tons a day could be made if there were sufficient wagons to carry the coal. On the Peking-Mukden line, on the Tientsin-Pukow line, on the Shanghai-Nanking line, on the Peking-Hankow line, and on others, there is a constant cry for more and more cars, carriages, and locomotives, and ever the cries fall upon deaf ears. The voices are as those which rise unheard in the wilderness. The Tongshan works is making as big an effort as possible to supply some new cars, but that will meet but a limited need. What is required is the quick importation of a quantity of up-to-date equipment, and that should be arranged for by the Board of Communications immediately and without waiting for current earnings to be available to defray the expense. The development of the dormant trade will in itself pay for the additional means to secure the profits. That is a thing which the authorities in the Board do not seem to realise.

No better illustration of the increase in the value of railroads can be given than those of America and Australia, where virgin country is opened up for settlement. In China all available land is under the plough. No matter in which direction the traveller might pursue his way, nor for what distance, he will begin his days and end them in cultivated areas. The crops and the settlers are always awaiting the railway, and in this peculiar respect China is infinitely better off than those countries which have to depend upon the railway to open up settlements. Despite that, the Chinese hesitate thoroughly to equip the railways they have for the services they are designed to render. As an inspiration those responsible for reluctancy in responding to the requests of the various railway managements for increased rolling stock should study the trend of railway affairs in the state of New South Wales. There is a country possessing not a tithe of the population which China boasts. In fact New South Wales claims something about 1,700,000 peoples only, as against China's 400,000,000, or against the least populated province, distant Kansu, which has 5,000,000 inhabitants. Yet what is the record of New South Wales in railways? During the six years ended June, 1907, the total number of passengers carried was 211,000,000. In the six years ended June, 1913, the total was 363,600,000, an increase of 152,000,000, or 72

per cent. The tonnage of goods and live stock in the first period was 16,000,000 tons, during the second period 24,000,000, an increase of 50 per cent. These figures, put into money, showed increases as follow:—Passenger earnings (Mexican currency), $90,000,000 to $140,500,000, an increase of 58 per cent. notwithstanding a considerable rise in fares; goods and live stock, $120,000,000 to $170,500,000, an increase of 45 per cent. The total earnings on all classes of goods was from $230,000,000 to $340,700,000, an increase of 50 per cent. During the whole six years in nearly every department there had been continuous expansion, but efforts were as continually made to meet it. On June 30, 1907, the number of locomotives was 656; in 1913 it had increased to 998, an advance of 52 per cent., not counting duplicate stock. That increase, however, does not indicate the true position, since additions had been made to the power of the engines. The total tractive power in 1907 was 13,000,000 lbs.; in 1913 it was 21,500,000 lbs., an increase of 65 per cent. The tractive power per engine had gone up from nearly 20,000 lbs. to over 21,000 lbs., an increase of 9 per cent. In the same period vehicles showed an increase from 12,700 to 19,000, or 51 per cent. The carrying capacity had increased from 111,452 tons to 213,311 tons, an increase of 91 per cent. The total expenditure in 1913 in connection with rolling stock alone, was $9,070,000. These figures show what can be done with a small population such as New South Wales possesses and which, it must be mentioned, is mostly concentrated in large cities. What then can be done in China with its vast industrious agricultural population already established on productive land? Give China the railways, and give the railways adequate rolling stock, and the state revenues would rise by leaps and bounds. Keep the railways starved, as they are at present, and the result cannot be otherwise than disappointing to those who know how to manage railways and who can see the vast losses being suffered by China simply on account of lack of appreciation of the value of the great transportation service which might easily be developed. There is surely call for decided activity on the part of the Board, and now that a new Cabinet has been created the least that can be expected is that the sweep of the new broom will be felt in those places where it is needed.

THE TIBETAN CONFERENCE

On September 12 the Chinese Commissioner for the settlement of the Tibetan question, Mr Ivan Chen, left Shanghai for Simla to take part in a conference in which representatives of the British and Indian Governments and of Tibet will participate. The conference, which will meet in October, will be attended by Mr. Ivan Chen on behalf of China; Sir Henry M'Mahon (Indian Frontier Secretary); Mr. Bell (I. C. S.) and Mr. A. Rose (Foreign Office) and Longchen Shatra (Tibetan Prime Minister).

The importance of this conference will be readily recognised. The question of China's suzerainty over Tibet will, it is to be expected, be settled once and for all. In the Anglo-Chinese Convention of 1906 that suzerainty was practically admitted and Great Britain engaged not to annex Tibetan territory nor to interfere in the administration of Tibet. The following year Great Britain and Russia signed an "arrangement" which specifically recognised the suzerain rights of China in Tibet. The signatory Powers engaged to respect the territorial integrity of Tibet and to abstain from all interference in its internal administration. These two instruments restored international recognition of China's suzerainty, which had been ignored when direct relations were established between Great Britain and Tibet in 1904, when the Younghusband Convention was signed.

China, however, is apparently not content with the acknowledgment of her suzerainty, but wishes to establish her sovereignty. When the Revolution broke out in 1911 the Warden of the Marches, Chao Erh-sen, had practically restored China's authority and prestige in Tibet. The revolution in China was attended by a revolt in Tibet, and the Tibetans succeeded in expelling the Chinese Amban and his guards from Lhassa. Desultory fighting has been carried on in the Marches for the past two years, but the Chinese have not succeeded in making much headway.

The Republican Government can hardly be congratulated upon its diplomatic management of the Tibetan Question. A British Note was presented to China on August 17, 1912, by Sir John Jordan, H. B. M. Minister at Peking. This was a protest against the assumption of all administrative power in Tibet by the Chinese officials in that country, and demanded that an agreement should be concluded defining and restricting the powers of China in Tibet. The conclusion of such an agreement was a condition precedent to Great Britain's recognition of the Republic of China. No reply was made by China to this Note until December 23, 1912, when it was claimed that China had kept within her treaty rights and that there was no need to negotiate a new Treaty on the subject. The text of this correspondence was published in the FAR EASTERN REVIEW of January, 1913.

It became evident that satisfactory results could hardly be expected from negotiations in Peking, and proposals were made for a conference either in London or in Simla Eventually it was decided to hold a tripartite conference at Simla, and Mr. Ivan Chen and Mr. Hu Han-ming, ex-Tutuh of Kwangtung, were appointed Commissioners for China. Political developments rendered it impossible for Mr. Hu Han-ming to accept the post, and Mr. Ivan Chen is now the sole Commissioner. To the difficult and not improbably thankless task before him he takes many of the qualities which would ensure success if success were possible. He may be depended upon to do much towards rendering possible a lasting adjustment of this, one of the most important of the external problems confronting the Republic of China.

CHINA'S FOREIGN ADVISERS.

China has so far managed to accumulate a presentable selection of foreign advisers. Men representing several countries have been engaged, and are drawing handsome salaries, but in return therefor are permitted to do little or nothing to bestow upon the nation the benefits of their learning or experience. Their efforts are apparently to be confined to the exertion requisite once a month in signing a receipt for their pay. China does not expect them to do what they would be pleased to call their duty. Therefore the observer is justified in concluding that they have been engaged merely to please the foreign nations, and to be dummies in make-believe reform. Were there genuine reform all these men would be "sweated," so great a demand would there be for their services. Even in the case of the Salt Gabelle, which the Government promised to reform in order to provide the security for the Reorganisation Loan, there has been startling and unexpected obstruction. Sir Richard Dane, who started out with the determination to put the Gabelle upon a profitable basis, met resistance at every turn. He was quickly shown by the Peking officials that his presence in China would be better appreciated were he to confine his attention to viewing the sights which other people travel so many miles at their own expense to see. Sir Richard made no headway, and when the deadlock arrived he was compelled to submit his case to the Ministers of the nations concerned in the loan. They deliberated and decided to take the strongest measures to impress upon the Government the fact that the Reorganisation Loan was made to China for reorganisation purposes, and that some evidence of sincerity in this regard would have soon to be given by the Government.

This revelation would seem to suggest that the Government obtained the £25,000,000 upon false pretences, and even the strongest supporters of the present *régime* find it exceedingly difficult to excuse the unpardonable neglect of the Government voluntarily to apply all the talent available to place the Salt Gabelle and other departments, upon a proper footing. Instead of that the officials actively resist progress. Were that the case in the provinces some excuse could be made on the grounds of misunderstanding of motives, but when the obstruction is carried on in Peking by officials under the thumb of the President it is difficult to understand.

Well-wishers of China were led to believe that there would be an era of progress under the present governing body, but the exhibition of the array of advisers being confined to attending to their own personal affairs is gradually compelling them to believe that they have discovered a reactionary movement where they expected to find a progressive one. Dr. Morrison is perhaps the only continuously busy man. His services are constantly employed. The others are left to their own devices, and spend most of their time in the occupation which made the great Micawber famous. China shows not the least indication of profiting by the experience of Japan, and seems to be content to follow the unprogressive and unprofitable course set by the generations of the years ago. The march of civilisation and the call of the world affect her not. It is lamentable to realise that she seems destined to drift to the point where foreign nations will, for their own protection, be compelled to take charge of the most important of her services. The men now engaged by her at salaries in the vicinity of £3,000 to £4,000 per year, and who could, if utilised, help her on the highway to prosperity, are as follow:

Political Adviser to the President.
Dr. G. E. Morrison (British).
Military Adviser to the President.
Lieutenant Colonel Brissaud-Desmaillets (French).
Advisers for Drafting the Constitution.
Professor Frank Johnson Goodnow (American.)
Professor Ariga (Japanese).
Ministry of War.
Major von Dinkelmann (German).
Colonel Banzai (Japanese).
Captain Borrey (French).
Ministry of Finance.
Dr. G. Vissering (Dutch), Honorary.
Dr. Arnhold (German).
G. Passeri (Italian).
Ministry of Communications.
G. Baur (German), Technical.
G. Charignon (French), Railways.
Dr. Hirai (Japanese), Railways.
Ministry of Foreign Affairs.
A. H. Eriksen (Dane), Telegraphs.
S. Larsen (Dane), Wireless Telegraphy.
H. De Codt (Belgian), Legal Adviser.
(An appointment has been offered in this Department to Baron Guido Vitale, Italian).
In Connection with the Quintuple Loan.
Sir Richard Dane (British), Salt.
Herr von Strauch (German), Assistant Salt.
N. Konovaloff (Russian), Audit.
H. Mazot (French), Acting Audit.
H. Pfeiffer (German), Loans.
Ministry of Interior. Mongolian Affairs.
F. A. Larson (Swede).
Police Administration
Colonel C. D. Bruce (British).

RAILWAYS, ROADS AND REBELS.

With the practical suppression of the rebellion the difficulties of the Government are still far from having reached the disappearing point. The bands of erstwhile soldiers, who retained their arms when the more or less organised rebel forces were broken up, remain as an unwelcome legacy. Also those who surrendered and were paid off cannot at once become merged in the industrial life of the country. Furthermore China has upon her hands a considerably greater number of troops than are necessary. In the present economic condition of the country the existence of an unduly great proportion of troops is not only a political menace, but is a brake upon the industrial development of the Republic.

Any scheme of disbandment on a large scale without making due provision for the employment of the men whose military services had been dispensed with, would be inviting further trouble. It is beyond dispute that men who have been engaged in military operations, especially those who leave peaceful avocations to take up arms, find it extremely difficult again to settle down to lawful pursuits. Especially is this so in China, where pillage is recognised as an inevitable concomitant of civil strife. Men whose minds have been inflamed by hopes, occasionally realized, of rich plunder could hardly be expected easily to resume the drab and hopeless existence of the Chinese of the lower classes. They have learnt that the ability to carry and fire a gun can secure for them food, clothing and a small stipend, with the additional prospect of achieving comparative wealth should they participate in the sack of a wealthy city. In view of the deadly monotony and the precarious reward for labour that attend the life of the Chinese coolie, it is scarcely surprising to find him disinclined to relinquish his rifle and revert to his hoe, his wheelbarrow or his ricksha. In the unsettled political condition of the country ample opportunity is offered him to join robber bands who levy tribute on the peaceable commercial and agricultural classes.

The method by which these bands of marauders should be eradicated does not fall within the scope of this article. The object in writing is to suggest a means by which, at all events, an augmentation of their number might be prevented An application of the *corvée* system would go far towards settling some of China's political and economic problems. The country is in a state of arrested development, and there are innumerable public works which, if taken in hand, would add vastly to the national wealth. What China has been able to do under the *corvée* system is attested by the Great Wall, one of the most remarkable human achievements in existence. If the workless element in China could be formed into a disciplined industrial army under strict supervision the return would be out of all proportion to the expenditure involved. China's communications are woefully inadequate; she requires railways, roads and efficient canals. Her mineral resources demand exploitation. Her bare hill-sides call for afforestation. There is work here that would keep millions busy for many years to come, and much of the work would be almost immediately productive. If instead of paying off rebel soldiers they were enlisted in a great industrial army they would become a source of profit instead of loss to the country. Similarly those of the loyal troops whose services are no longer em-quired could be dealt with in this manner with advantage to themselves and to the nation. To turn them loose with a few dollars speedily to join the ranks of the workless and probably of the bandits, is obviously a short-sighted method of dealing with the problem.

The organisation of such an industrial army would be difficult, but certainly not impossible. These men have been accustomed to discipline of a sort, and it should not prove to be beyond the power of the authorities to divert their labour from an unproductive to a productive channel. China is suffering from a plethora of "Generals;" should they be turned into Captains of Industry and their followers into industrial soldiers, peace and prosperity would the sooner be the portion of the Republic of China.

THE MONTH IN CHINA

Politics and not business continued to engross attention in China during September. The capture of Nanking by Chang Hsun, while it practically put a period to the rebellion, brought the Government face to face with several serious problems. The city was looted and the populace subjected to outrage at the hands of the Government troops. Moreover three Japanese subjects were killed and the Japanese flag fired upon. This caused great excitement in Japan where popular meetings were held at which it was demanded that strong measures should be taken against China. The Japanese Government contented itselt with demanding an apology and compensation for the families of the men who were killed. The opportunity was taken at the same time to demand an apology for outrages committed upon Japanese at Hankow and elsewhere. Although the Japanese demands were admitted to be moderate, a stipulation that Chang Hsun should personally apologise to the Japanese Consul at Nanking and that his troops should perform an expiatory march past the Consulate was, it was thought, likely to give trouble. China, however, promptly accepted the demands, and although no less than ten Japanese men-of-war were assembled off Nanking, there was towards the end of the month a reasonable prospect of matters being satisfactorily adjusted. A complication has been caused by an affray between Chinese police and Japanese soldiers at Changli in Manchuria, in which five of the former were killed. A joint committee of Chinese and Japanese officials is investigating this affair.

The most important domestic event was the completion of Mr. Hsiung Hsi-ling's Cabinet and its acceptance by the Parliament. Reference to the new Cabinet will be found elsewhere. Parliament continued its sittings and decided that the Presidential election was to take place early in October.

Although the business depression continues there have been signs that confidence is gradually being restored and that, provided nothing unforeseen occurs, a marked revival may be expected.

The representations made to the Premier by the British and Russian Ministers, acting on behalf of the Quintuple Group, brought forth fruit. The reform of the Salt Gabelle was one of the stipulations embodied in the Agreement for the £25,000,000 loan, but a reactionary section of the officials in Peking managed to frustrate every effort made to give effect to the clauses relating thereto in the Agreement, and succeeded temporarily in rendering the appointment of Sir Richard Dane, a Salt Expert from India, abortive. The contention of this section was that China herself could adequately reform the Gabelle, and had, in fact, already instituted a service to that end. What was happening was that the commission appointed some time ago by the Government devoted themselves to obstructing every suggestion made by Admiral Tsai Tin-kan, the officer appointed when the Reorganisation Loan was floated, and Sir Richard Dane, and doing nothing to make the Gabelle the organisation it ought to be. Instead of monies being collected sufficient to ensure the service of the loans secured upon the revenue of the Gabelle there was almost an entire suspension of collections—or perhaps it would be more correct to say that there was a suspension of payments to the Treasury. By the end of August conditions became alarming. Sir Richard Dane's investigations disclosed a most disquieting state of affairs, and a meeting of the Ministers of the countries concerned in the loan decided to enter an emphatic protest and to give final warning that unless the Gabelle were reorganised according to arrangements serious steps would have to be taken.

Previous to this, however, Admiral Tsai Tin-kan had been strenuously at work endeavoring to impress upon the Government the necessity of reorganising the Gabelle, not so much because an undertaking had been entered into with that object in view, but because it was absolutely necessary for the welfare of the State. His strongly pronounced views in this direction undoubtedly had much to do in compelling the Government to act after the British and Russian Ministers had expressed themselves. The appointment of the new Cabinet also helped towards a more reasonable attitude, and when they came to consider the question they realised that the old organisation would have to make way for the new one. They consequently announced to the Group that Admiral Tsai Tin-kan and Sir Richard Dane would no longer be obstructed, and that the old Commissioner who stood between them and the Minister of Finance would be removed, the powers erstwhile held by him being conferred upon Admiral Tsai. The Salt Gabelle of China is one of the most ancient services in the land—which fact can be fully realised upon perusal of the exhaustive article published in the Far Eastern Review last December—and its roots are entwined in the very social fabric of those regions where salt is manufactured. Sir Richard Dane is at present making a reconnaissance of some salt producing areas and later on he will devise a scheme for control which will render unto Cæsar that which is Cæsar's without making the people, who have in the past been born to believe that the salt and the earth is theirs to monopolise, feel any particular hardship. The task is a difficult one—but how difficult will not be realised until pressure is brought to bear on the monopolists to yield more than has been their wont to the Central Government.

A development, the full significance of which is not immediately apparent, is the appointment of Admiral Tsai Tin-kan as Controller-General of the Customs, and of Chang Hu as Chief Salt Administrator and Associate Chief Inspector with Sir Richard Dane.

THE QUINTUPLE GROUP

Those who have supported the financial organization known popularly as the Quintuple Group, have always done so with the mental reservation that absolute loyalty among those in the Group was a *sine qua non*. Obviously, as the intention of the Group was to prevent promiscuous borrowing and so safeguard China's credit, the main object for which the combination was formed would be defeated if any one of the partners lent assistance to wild-cat financing of the Crisp type, which provided for one and three-eights per cent. commission or "squeeze" to the inside clique who held the preliminary agreement to float the loan. Some of the partners have remained absolutely loyal, and it will be remembered that the British Foreign Office resolutely refused to countenance the Crisp Loan last year.

Latterly there have been rumours that all the partners are not absolutely loyal. Statements were current that the allurements of easy profits had been too great for weak vessels, and that an unfair advantage was being taken of those who were keeping the compact in word and spirit. This has led to the conclusion that it would be better for the Group to dissolve except insofar as Central Government loans are concerned and thus terminate a position that had become ludicrous. Far better would it be for China if the Group could continue on the lines upon which it was originally founded, but when there was not perfect loyalty the position had to be faced frankly and independent financing reverted to. The development of industries in China is of the first importance and, much as independent financing is to be deprecated for reasons which need not be recapitulated, as the Group is not able to fulfil its original function, it is much better that each nation should be enabled to make its own arrangements.

DEATH OF MR. WILLIAM CROZIER

It is with the profoundest regret that we have to announce the death of Mr. William Crozier, formerly Editor of the Far Eastern Review. At the moment no details are available, except that Mr. Crozier died suddenly at Manila on September 22. Mr. Crozier was one of the best known and ablest newspaper men in Manila and his editorship of the Manila *Daily Bulletin* raised that paper to a very prominent place in the newspaper world in the Philippine Islands. The news of his death will be received with sincere sorrow throughout the Far East in those quarters in which his cheerful personality was known.

CHINA'S CABINET.

The Cabinet chosen by Mr. Hsiung Hsi-ling, Premier and Minister of Finance, has been endorsed by the National Assembly and the Senate. It is generally admitted that the Cabinet constitutes a good team, and, if it holds together, may do useful work for China.

Mr. Hsiung Hsi-ling's record is fairly well known. He has had the advantage of travelling in foreign countries and was Minister of Finance in Mr. Tang Shao-yi's Cabinet. Before taking the Premiership he was Military Governor at Jehol, and the work he did there enhanced his reputation.

Mr. Sun Pao-chi, Minister of Foreign Affairs, has held office as Chinese Minister in France and Germany. He was Governor of Shantung in 1911 when the revolution broke out. Under the Republican Government he was appointed Comptroller-General of the Customs Revenue Council early in 1913 and in June visited Japan on a special mission.

Mr. Chu Chi-chien, Minister of Internal Affairs, was formerly Minister of Communications. As Director-General of the Tientsin-Pukow Railways he performed valuable services for the Government.

General Tuan Chih-jui retains the portfolio of War. He was largely responsible for the reorganisation of the army in the north. General Tuan has been Minister of War from the inception of the Republican Government.

Admiral Liu Kuan-hsiung retains the office of Minister of the Navy. He was educated at the Royal Naval College at Greenwich, In Dr. Sun Yat-sen's Cabinet at Nanking he was Minister of the Navy, and he has the unique distinction of having occupied that post ever since the declaration of a Republican *régime* in China.

Mr. Liang Chi-chao, Minister of Justice, is well known from his association with Kang Yu-wei in the reform movement which collapsed in 1898, when Kwang-hsu was virtually deposed by

the then Empress-Dowager. Mr. Liang escaped to Japan, and from there assisted materially the reform cause by his writings.

Mr. Chang Chien, Minister of Industry, is a distinguished scholar, who has never accepted an official post, although frequently pressed to do so. His activities have been devoted to trade and industry, and his name is associated with a number of important enterprises.

Mr. Chou Tzu-chi, Minister of Communications, was for some years Chinese Consul-General at New York. Under the Republican Government he was Governor of Shantung and more recently Director of the Bank of China. This appointment is considered an excellent one, as Mr. Chou is a man of progressive ideals, and it is confidently expected that he will do much to advance the important work of railway construction in China.

Mr. Wang Ta-hsieh, Minister of Education, was Chinese Minister in Great Britain for three years and later went to England to study the Constitution. Under the Republican Government he was appointed Minister to Japan.

U.S. RAILWAY BUSINESS FOR APRIL

The total operating revenues of the railways for April were $237,362,424, an increase over those of April of last year of $22,893,968 in the aggregate, or 9.7 per cent. per mile of line. This was whittled down by an advance in operating expenses of 12.3 per. cent. per mile of line to an increase in net operating revenue of $1,834,073 in the aggregate, or 2.4 per cent. per mile of line.

The amount of this net operating revenue was $58,337,434. Taxes for the month took $10,482,492, an increase per mile of line of 7.9 per cent.; this and shrinkage in revenue from outside operations left operating income amounting to $47,516,273, an increase of $810,427 or less than 1 per cent. per mile of line. This aggregate operating income for the 222,156 miles amounts to $214 per mile of line for the month, or $7.13 per mile of line per day.

It is the operating income to which the railroads must look for betterments, improvements, new construction, and for interest on bonds and dividends. Except for the fact that there was an anthracite coal strike in April of last year, this operating income for the railways as a whole would not have averaged an increase, and for the railways of the eastern group would have been less this year than last, instead of increasing 14.6 per cent. It was lower per mile of line for these railroads in April, 1912, by 33 per cent. than in April, 1911; and 3.8 per cent. greater in April, 1911, than in April, 1910. For the railways of the southern group this operating income per mile of line was 16.5 per cent. less than in Aprilt 1912; less in April, 1912, by 1.9 per cent. than in April, 1911; and less in April, 1911, by 14.5 per cent. than in April, 1910. For the railways of the western group this operating income per mile of line was 3.2 per cent. less than in April, 1912; greater in April, 1912, by 2.1 per cent. than in April, 1911; less in April, 1911, by 12.3 per cent. than in April, 1910.

These figures are from the summary of revenues and expenses of the steam railways for the month of April, compiled by the Bureau of Railway Economics from their reports to the Interstate Commerce Commission, and cover the returns of about ninety per cent. of the steam railway mileage of the country.

PUBLICATIONS

(In some instances a more extended notice will appear later).

"Petroleum in Southern California," by F. McN. Hamilton, State Mineralogist.

The territory covered in this volume consists of that part of the state of California which is geographically Southern California and contains the counties of San Louis Obispo, Santa Barbara, Ventura, Los Angeles, Orange, Riverside and San Diego.

A detailed description is given of the various oil fields, about twenty in number, together with analyses of the various kinds of oil found; the names of the companies operating and the number and production of the wells.

The total number of producing wells to March 1st, 1912, was 1,938, abandoned wells 1,115, and wells being drilled 179. The total production in 1911 was 19,288,697 barrels of 42 U.S. gallons and the average product per well per day was for Ventura Co. 4.25 bls.; Los Angeles Co., 25.90 bls. and Santa Barbara 48.47 bls.

No figures are given as to costs of drilling wells, or of cost of production or value of the output. The total productive area is given as 13,020 acres.

The area covered in this report is only part of the oil-producing area in California and the individual fields are smaller than some of those further north. The geological conditions under which the oil occurs are somewhat similar for the various isolated fields. Most of the petroleum produced is a heavy asphaltic grade with small amounts of gasolene and kerosene which is typical of the general California product.

Maps, photographs and geological sections of the various fields give the reader an excellent idea of the conditions obtaining, and on the whole it is an excellent and valuable illustration of the records of applied modern system and engineering science as recorded by the State Mining Bureau.

The publication of these and similar statistics, together with the application of modern methods of geological and engineering science, afford to the specialist and lay reader much valuable information which otherwise would not be easily available.

Modern progress in science is resulting in the publication of new methods and results which tend to aid workers in all parts of the world and to make the winning of wealth from nature more systematized and less complicated.

Petroleum finding at the present day is practically out of the realms of guess work, as after careful preliminary study of the rock formations and the conditions under which they occur, it is quite possible to locate producing wells and also to predict their output.

The reading of the descriptions of the results of petroleum development in a small part of one state contrast strikingly with the absence of such information regarding any part of China. Some of the financial problems of China would be solved at home by the intelligent development of its known resources of which petroleum is not the least.

The book contains 430 pages, cloth bound, is well illustrated and is accompanied by six maps of the different fields. The price of this publication has been fixed at G. $1.50, with an additional 22 cents for postage, and may be obtained by applying to the State Mining Bureau, Ferry Building, San Francisco.

"Record Breaking," an interesting little pamphlet issued by the American Blower Company, containing particulars of the forced draft sets supplied by the company to the U. S. men-of-war, Utah and Florida.

"Two Yokes in Transportation." The T. H. Symington Co. of Baltimore, Rochester, Chicago and New York This pamphlet gives much interesting information about the Farlow Draft Rigging.

Chicago Pneumatic Tool Company's Bulletins for March, April and May, 1913.

The Lovell-McConnell Mfg. Company, 47 Broadway, New York. This Company sends several valuable pamphlets on the Automobile Signal Problem, and leaflets about the Klaxon horn.

"Kahn System Standards." This is the fifth edition of the hand book on reinforced concrete, issued by the Trussed Concrete Steel Co., of Detroit, Michigan. The new edition contains the following new features, which appear for the first time :

Photographic views of various types of Reinforced Concrete structures; Interior views of various types of Reinforced Concrete floor construction ; Complete Specification for Reinforced Concrete; Illustrated discussion of the advantages of Reinforced Concrete Construction ; Tables of comparative cost of Reinforced Concrete, Wood Mill Construction and Structural Steel ; Floredome and Floretyle Construction ; many new tables, including those for beams and also a complete revision of the text matter. "Kahn System Standards" is divided into sections covering completely the following matter : Advantages of rigid connection of shear members ; Properties of Kahn Building Products ; Advantages of Reinforced Concrete Construction ; Specifications for Reinforced Concrete ; Theory of Reinforced Concrete ; Typical Installations ; Illustrations of various floor constructions ; Complete tables covering solid concrete slabs, reinforced with Kahn Trussed Bars, Rib Metal and Hy-Rib ; Tables for Floredomes, Floretyles and Terra Cotta Tile floors ; Tables for Reinforced Concrete beams, Square Columns and Hooped Columns : Tables for Reinforced Concrete Footings ; Materials in concrete and mortar and Estimating Table. "Kahn System Standards" is issued primarily for practising Architects, Engineers and Contractors, to whom it is distributed free. To others a nominal charge of 50 cents per copy is made.

"The Britannic Question," by Richard Jebb. Longmans, Green & Co., New York, Bombay and Calcutta.

"The Flowery Republic," by Frederick McCormick. D. Appleton & Company, New York

"Cook's Far Eastern Handbook." The July-December, 1913 edition of this excellent publication, gives a mass of information relative to steamer routes, railways and fares.

"Slavery and Peonage in the Philippine Islands," by Dean C. Worcester, Secretary of the Interior. Bureau of Printing, Manila.

THE UNIVERSITY OF HONGKONG

HISTORICAL SKETCH OF THE INSTITUTION

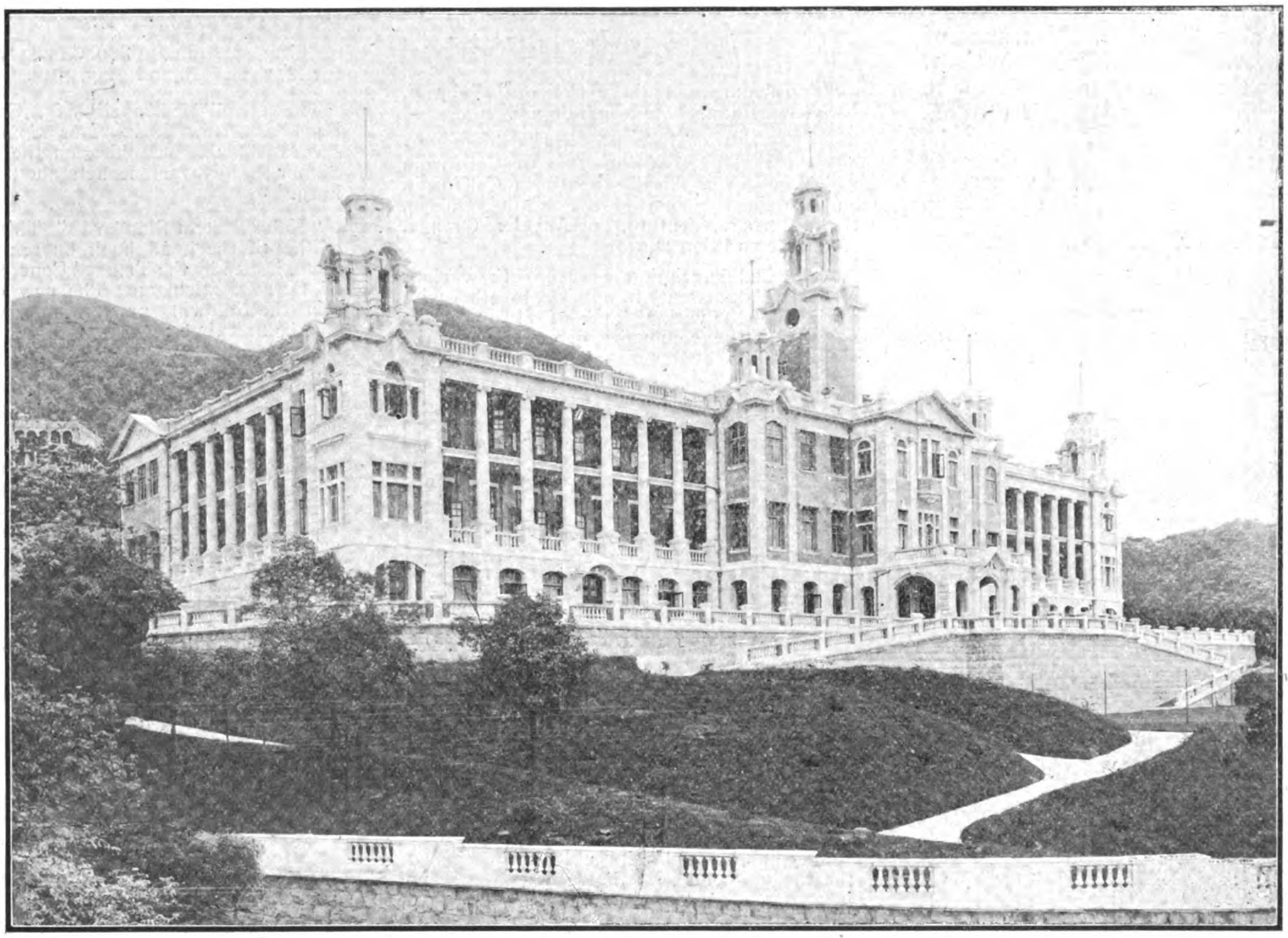
The idea of establishing a University in Hongkong was first suggested in 1905, but it was two years later before the matter took definite shape. The Governor of the Colony, Sir Frederick Lugard, advocated the formation of a University in a speech made in December, 1907. Mr. H. N. Mody at once offered to erect the necessary buildings at a cost of $150,000 and to give $30,000 towards an endowment fund.

At the time that this offer was made, there was already on foot a project for enlarging the scope of the Hongkong College of Medicine. This Institution had been founded in 1887, under the style of the College of Medicine for the training of Chinese students in Western medicine, and after twenty years of patient work it was incorporated by Local Ordinance in 1907 under the new name. Up to this time (1907) one hundred students had been enrolled, and of these thirty-one had passed as Licentiates. The College had no building of its own, students lived in their own houses or in lodgings, and the lectures were delivered by permission at various Hospitals and Institutions. Stimulated by a bequest of $10,000 from Mr. Tang Chuk Kai, and of $50,000 from Mr. Ng Li Hing, and by the grant of a small site by Government, the Court of the College made an appeal in 1908 for further funds to erect College buildings and to engage a small permanent staff.

A Committee consisting of the following gentlemen under the Chairmanship of the Governor:—Bishop Lander, Bishop of Victoria, the Hon. Mr. F. H. May, C.M.G., Colonial Secretary, the Hon. Sir Paul Chater, Kt., C.M.G., the Hon. Mr. A. M. Thomson, Colonial Treasurer, the Hon. Mr. W. Chatham, C.M.G., Director of Public Works, the Hon. Dr. J. M. Atkinson, Principal Civil Medical Officer, the Hon. Mr. H. E. Pollock, K.C., M.L.C., the Hon. Dr. Ho Kai, C.M.G., M.L.C., the Hon. Mr. W. J. Gresson, M.L.C., Mr. E. A. Irving, Director of Education, Mr. J. C. Thomson, Dr. G. P. Jordan, Mr. Murray Stewart, Mr. D. R. Law, Mr. F. B. L. Bowley, Crown Solicitor, and Mr. Cecil Clementi, Assistant Colonial Secretary, was convened by the Governor on the 18th of March, 1908, to consider the project of establishing a University, and at its first meeting a Sub-Committee was appointed to draw up an estimate of the cost of the necessary building and equipment. The Sub-Committee, of which the Hon. Sir Paul Chater was Chairman, presented a report on September 25th, 1908. The report with its enclosures and estimate was very lengthy, but the gist of it was that it would be impossible to erect buildings, adequate for the purpose in view, at a cost covered by the amount promised by Mr. Mody.

On the presentation of the report it was proposed to accept Mr. Mody's offer to erect a building at a cost of $150,000, in which the Hongkong College of Medicine and Technical Institute should be located, and to incorporate a University under Ordinance.

Objections were raised to this proposal on the grounds that the cost of adequate buildings and equipment had been underestimated and that before any steps were taken for establishing a University an endowment fund of not less than £100,000 and an equipment fund of not less than £10,000 should be secured; and it was suggested as a way out of the difficulty that if a larger sum were not available a building should be erected at a cost of $150,000 in which the Hongkong College of Medicine and the Technical Institute might be accommodated in order to form a nucleus of the proposed University pending the collection of an adequate endowment fund upon which to establish the University. This scheme was approved by the Hongkong College of Medicine and by the Committee, but it did not fulfil the condition under which Mr. Mody had made his offer, viz., that the University should be incorporated so soon as the building was erected. The difficulty as to the cost of the buildings was overcome by the generosity of Mr. Mody, who undertook to erect them whatever the expense, but would not be responsible for furnishing or equipment or for any donation to the Endowment Fund if the cost of the buildings should exceed $180,000.



Hongkong University

The Committee owing to departure of certain members from the Colony had undergone some changes in its personnel and was now constituted as follows:—

H.E. Sir F. D. Lugard, Chairman, Bishop Lander, Bishop of Victoria, the Hon. Sir F. H. May, Colonial Secretary, the Hon. Mr. A. M. Thomson, Colonial Treasurer, the Hon. Mr. W. Chatham, Director of Public Works, the Hon. Mr. A. W. Brewin, Registrar General, the Hon. Sir Paul Chater, Mr. H. N. Mody, Mr. E. A. Irving, Director of Education, the Hon. Dr. Ho

Hongkong University.—The Drawing Office

Hongkong University.—The Chemical Laboratory

Kai, the Hon. Mr. Wei Yuk, Mr. C. Clementi, Mr. Lau Chü Pak and Mr. A. Turner.

At this juncture Messrs. Butterfield & Swire and allied firms came forward on the initiative of Mr. J. H. Scott, senior partner of J. Swire & Sons, with a donation of £40,000 which, joined to the generous subscriptions of the Chinese of Hongkong and Canton, made the ultimate success of the project practically certain. The Secretary of State notified his consent to the grant of the proposed site and cordially approved the project, which the China Association also warmly supported. The Viceroy of Canton (H.E. Chang Jen Chung), who exhibited great enthusiasm for the scheme, issued an official Manifesto inviting subscriptions towards it, and setting out the grounds upon which he considered it to be a benefit to China. Sir Robert Hart wrote in commendation, as also did the Governor of the Straits Settlements, the Governor of Macao, and the Municipal Council of Shanghai. The Government of China made a grant to the fund, while the work of a Chinese Committee consisting of Dr. Ho Kai, Mr. Wei Yuk, Mr. Lau Chü Pak and one hundred Chinese gentlemen in collecting subscriptions was so successful that the Chinese communities of Canton, Macao, Saigon, Newchwang, Amoy, Penang, Waichow and Australia, added their subscriptions to those of the Hongkong Chinese community, and finally the British Government intimated that the Imperial Exchequer would provide £300 per annum for scholarships for British subjects, and that His Majesty had been graciously pleased to direct that the holders should be called "King Edward VII Scholars" as a token of his personal interest. Before the end of the year 1909 the Endowment and Equipment Fund had reached the sum of $1,279,164.

Mr. Mody's generous gift was now accepted unconditionally, and the erection of the building commenced forthwith.

The University was incorporated under Hongkong Ordinance and came into existence on March 30th, 1911.

The Foundation Stone was laid on March 16th, 1910, and in the course of the ceremony, the Governor read a telegram from the Secretary of State to the effect that His Majesty had created H. N. Mody, Esq., a Knight Bachelor. Delegates of the Viceroys of Canton and Nanking were present and spoke at the ceremony.

By March, 1912, the main building was practically completed. A house for a Principal, and houses for two Professors had also been erected, and on the 11th of the month the University was formally opened by His Excellency Sir Frederick Lugard, who received the Buildings from Mr. N. H. Mody, son of the late Sir Hormusjee Mody, in the name of the University. One of the leading Chinese citizens of Hongkong, the Hon. Dr. Ho Kai, was created a Knight Bachelor.

Sir Charles Eliot, Vice-Chancellor of the Sheffield University, was appointed Principal and Vice-Chancellor and arrived in June, and the necessary nucleus of the staff having been brought together the three Faculties of Medicine, Engineering and Arts were working in October.

The success of the University was assured from the first opening of its Registers, for all the available hostel accommodation was quickly taken up and the C.M.S. Hostel (St. John's Hall) was compelled to extend.

Present Position of the University.

The Buildings consist of the Main Building, the Quarters for the Staff, a University Hostel and a School of Anatomy, the last two being in course of erection. The main building contains lecture rooms, etc., calculated to afford accommodation for five hundred Undergraduates, and it is planned so as to be capable of extension.

The chief feature is the Great Hall eighty feet by fifty feet with domed roof forty-three feet high.

There are eleven class rooms and eight laboratories and workshops, with libraries, a common room for students, and committee rooms, offices, and coolies' quarters in basement.

The University is built on perhaps the finest site available for the purpose on the Island and is in the neighbourhood of the Hospitals, whose proximity is a necessity for the instruction of Medical Students. It is located on the side of a hill, and in addition to the large area occupied by the buildings it has been found possible to provide a playground two hundred and seventy-five feet square, by expending a considerable sum on levelling and on the construction of retaining walls.

The site has been given by the Colonial Government, together with a large space immediately adjoining for Residential Quarters for Students, and a smaller space for the erection of an Anatomical Laboratory. The whole comprises an area of 709,789 sq. ft., situated two hundred feet above the sea and overlooking the City of Victoria, with a magnificent view over the Harbour.

Immediately below the University is the site upon which the Church Missionary Society have built a Hostel (separated only by a public road from the University grounds), and it is understood that the Roman Catholic Mission will probably build another in the immediate neighbourhood. Directly above the University grounds is the site acquired by the London Missionary Society for a similar purpose; their hostel is almost completed.

The cost of the buildings and preparation of the ground, which was borne by Sir H. N. Mody—whose death was an irreparable loss not only to the University but to the Colony—is approximately $345,000. The value of the sites given by the Government is estimated at $176,297; the cost of the Anatomical School is estimated at about $30,000, most of which sum was separately raised by the Chinese.

Objects.

The objects which the University has in view are described in the Preamble to the Ordinance of Incorporation as the promotion of Arts, Science and Learning, the provision of higher education, the conferring of degrees, the development and formation of the character of students of all races, nationalities, and creeds, and the maintenance of good understanding with the neighbouring country of China. With reference to the first two of these objects, it was stated in various speeches which were made at the time when the scheme was inaugurated, more especially in those delivered at the laying of the Foundation Stone, that the desire of the promoters was to begin with Faculties (Medicine and Engineering) which would be of practical utility to China in coping with disease, in developing her resources by railways and by the exploitation of her mineral wealth, and in checking by the light of modern engineering science the terrible floods which almost every year occasion famines and great loss of life.

To these has been added, at the special request of the Chinese residents in Hongkong, a Faculty of Arts. The courses given in this faculty include Chemistry, Physics, Mathematics, History, and the English and Chinese languages and literature and a general course in Political Economy. More specialised courses in this subject have recently been provided by the generosity of Mr. Cheung Pat Sze and his partners, who have also secured the establishment of a course in International Law and Jurisprudence. The special courses in Political Economy are, (1) Economic Theory and Statistics; (2) Economic and Constitutional History; (3) Descriptive Economics; (4) Commercial Law and Practice, Business Organisation and Accounting; (5) Public Administration and Finance. It is hoped that they will be useful to those who wish to enter the public service of their country and also to those who contemplate a business career.

The next point mentioned in the Ordinance is the Conferring of Degrees. That the degrees of the University should be equal to those conferred by British Universities was a fundamental proposition, and it was on this basis that the subscriptions were raised. The Viceroy of Canton (His Excellency Chang Jen Chun), who was an ardent supporter of the University, asked for an assurance on this point, and when satisfied issued a striking manifesto in support of the scheme. The original Committee recorded by resolution that the Degrees should be equal to those of a British University, and this has been confirmed by a Resolution of the University Court.

The third object is stated to be "the development and formation of the character of all races, nationalities and creeds." With this object in view it was provided by section 20 of the Ordinance that the University should be Residential, *e.g.*, that all students must reside in the quarters provided, or in Hostels founded by religious bodies and conducted under Regulations approved by the Council. It is intended further to promote the association of Staff and Students, so that the former may exert a good influence. It is hoped that association in games will have this effect, and the Government of the Colony recently presented a site for a second field four hundred feet long and half as broad. The University Union is at present engaged in collecting funds to level the area. The root idea of the University of Hongkong is to provide a place for Higher Education where Chinese youths can remain under the influence of their own parents and guardians in the environment of their own people. Here they will be subject to the strong control which Chinese opinion exerts upon young men, instead of being adrift in a foreign country where a liberty unknown to students in the East is allowed to Undergraduates.

It is hoped that in founding the University a service has been rendered to all the schools of South China and indeed of China as a whole. The time has come for the co-ordination and standardising of the excellent work done by the Hongkong Governmnt schools and other educational establishments, and the best method of securing this result is the establishment and recognition of a Matriculation Examination which can be used as a School Leaving Examination. University Authorities have devised their Matriculation Examination with this end in view. They hope and believe that the present syllabus is sufficiently elastic and yet sufficiently exacting to satisfy the requirements of those schools in which English is a medium of instruction, and they are prepared to hold examinations at various centres on receipt of a reasonable number of applications. Such applications, which may conveniently be forwarded through the Headmasters of Schools, should reach the Registrar at least three months before the date of the examination.

Finally the Ordinance of Incorporation states that it is the object of the University of Hongkong to promote a good understanding with China. The scheme has been welcomed by prominent Chinese, both statesmen and private persons, as well as by Chinese communities both in China and abroad.

Constitution.

The constitution of the University provides for a Court composed of life, ex-officio, and nominated members numbering at present forty; of a Council consisting of seventeen members partly elected by the Court, partly by the Senate, and partly ex-officio; and of a Senate consisting of the Principal, the Staff of the University, and the Director of Education for Hongkong. The Governor of the Colony is ex-officio Chancellor, and it will be noted that the Principal Civil Medical Officer, the Director of Public Works, the Director of Education and the Registrar General (Protector of Chinese) hold ex-officio seats on the Court and Council, thereby identifying the local Government with the University, securing their help and experience, and ensuring a continuity of policy. The Principal is Vice-Chancellor and President of the Senate.

List of Officers.

The following are the office holders:

Patron:—His Majesty the King.

Chancellor:—His Excellency Sir Francis Henry May, K.C.M.G., B.A.

Vice-Chancellor:—Sir Charles Eliot, K.C.M.G., C.B., M.A., D.C.L., LL.D.

Pro-Vice-Chancellor:—G. P. Jordan, M.B., C.M., M.R.C.S.

Deans:—Francis Clark, M.D., M.R.C.P., D.P.H., D.T.M. & H. (Faculty of Medicine); C. A. Middleton Smith, M.SC., M.I.M.E. (Faculty of Engineering).

Registrar:—A. C. Franklin, F.I.C.

THE COURT.

Major-Gen. C. A. Anderson, C.B.; Hon. Mr. John A. Bucknill, K.C.; Chan Chik Yü; Chan Kang Yü; Hon. Sir C. P. Chater, Kt., C.M.G. (*Treasurer*); Hon. Mr. W. Chatham, C.M.G.; Chau Siu Ki; *Cheung Pat Sz; Chiu Yü Tin; *Dr. Francis Clark; Hon. Mr. C. Montague Ede; G. T. Edkins; Sir Charles Eliot, K.C.M.G., C.B.; *Dr. R. M. Gibson; Hon. Mr. E. R. Hallifax; Hon. Mr. E. A. Hewett, C.M.G.; E. A. Irving; Dr. J. T. C. Johnson; *Dr. G. P. Jordan; *Hon. Sir Kai Ho Kai, C.M.G.; Lau Chu Pak; *Sir Frederick Lugard, G.C.M.G., C.B., D.S.O.; *H.E. Sir Francis Henry May, K.C.M.G. (*Chancellor*); Hon. Mr. C. McI. Messer; N. H. N. Mody; Ng Hon Tsz; Ng Li Hing; *Rev. T. W. Pearce; *Hon. Mr. H. E. Pollock, K.C.; Right Revd. Bishop Pozzoni; Sir William Rees Davies, C.J.; Hon. Mr D. Landale; D. K. Sethna; Hon. Mr. C. Severn; Hon. Mr. E. Shellim; Professor C. A. Middleton Smith; N. J. Stabb; Hon. Mr. A. M. Thomson; Right Revd. Bishop Lander; Hon. Mr. Wei Yuk, C.M.G.

THE COUNCIL.

Sir Francis Henry May, K.C.M.G., B.A., *Chairman*; Sir Charles Eliot, K.C.M.G., etc., etc., *Vice-Chancellor*; G. P. Jordan, M.B., M.R.C.S., *Pro-Vice-Chancellor*; Hon. Sir C. P. Chater, Kt., C.M.G., Treasurer; Hon. Mr. W. Chatham, C.M.G.; Francis Clark, M.D.; Hon. Mr. E. R. Hallifax, B.A.; E. A. Irving; J. T. C. Johnson, F.R.C.S.ED.; Hon. Sir Kai Ho Kai, C.M.G., M.B.; Lau Chu Pak; Oswald Marriott, M.D.; Mr. Evan Ormiston; Hon. Mr. H. E. Pollock, K.C.; C. A. Middleton Smith, M.SC.; Hon. Mr. Wei Yuk, C.M.G.

* Life Members.

THE SENATE.

Sir Charles Eliot, K.C.M.G., C.B., D.C.L., M.A., LL.D., *Chairman*; G. P. Jordan, M.B., C.M., M.R.C.S.; Francis Clark, M.D., M.R.C.P., D.P.H., D.T.M. & H.; C. A. Middleton Smith, M.SC., M.I.M.E.; W. J. Hinton, B.A.; K. H. Digby, M.B., B.S, F.R.C.S.; C. Forsyth, M.D., CH.B., F.R.C.S. ED; A. C. Franklin, F.I.C.; E. A. Irving; W. V. M. Koch, M.D., C.M.; H. Macfarlane, D.P.H., D.T.M. & H.; O. Marriott, M.D., B.S.; T. H. Matthewman, M.ENG., A.M.I.E.E.; A. E. W. Salt, M.A.; E. J. Surman, B.SC.; A. G. Warren, B.SC. ENG., A.M.I.E.E.; J. D. Wright, M.A.

Commenting on the University and its work, the *Engineer* says "The majority of students have decided to take up engineering work, and, as the University has very limited funds at its disposal, it seems almost a pity that the technical and scientific departments were not fully developed before any attempt was made to establish other Faculties. In a word, it would probably have been better, so far as British interests in China are concerned, to have established a large school of technology in Hongkong, and to have allowed it gradually to expand into a university, first of all by affiliation with the existing Medical College—founded twenty years ago—and, later on, by the establishment of other Faculties. However, there were many conflicting interests to be considered, and the University is now an established fact, and must be dealt with as it is.

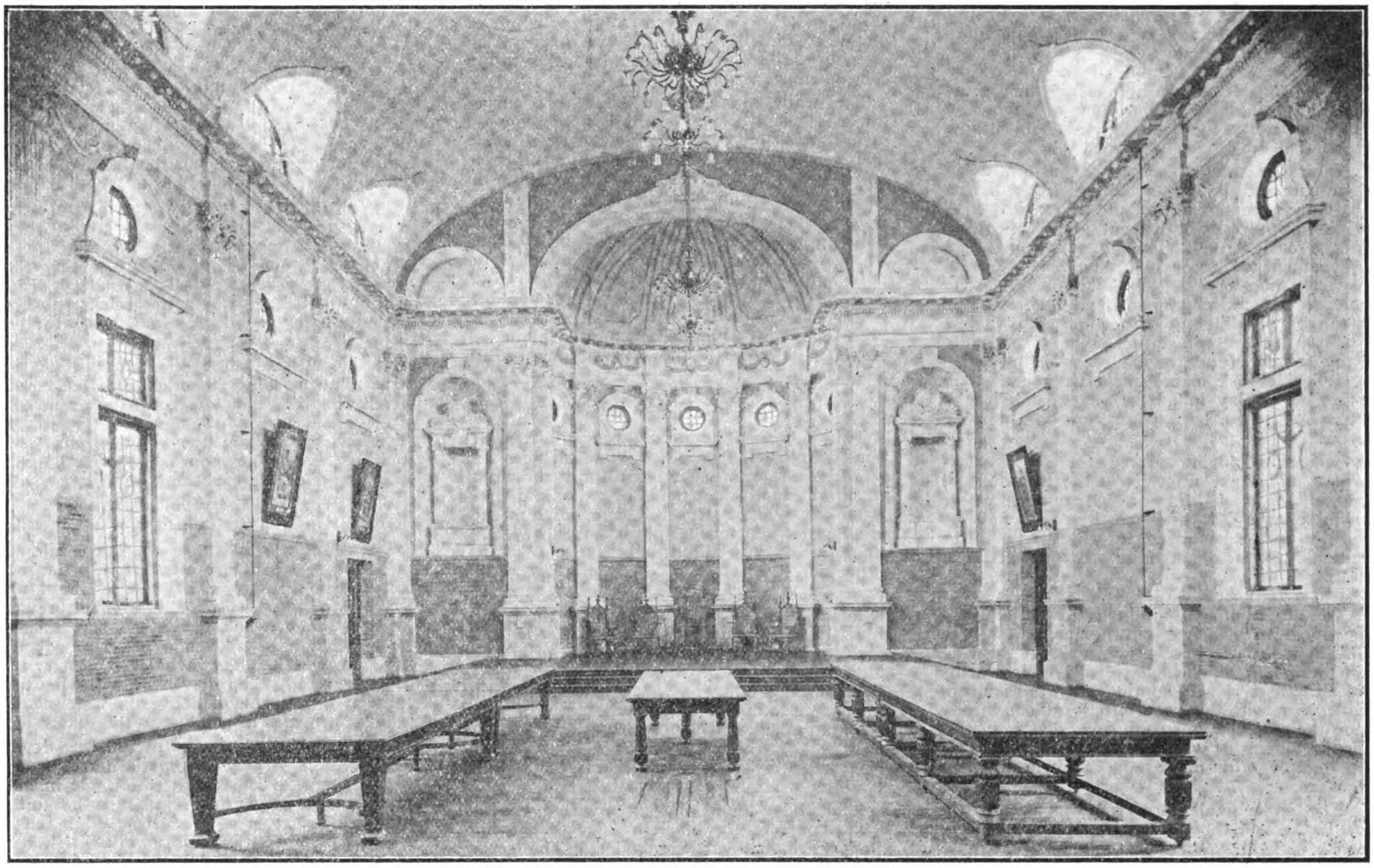
"The student at Hongkong pays £30 per annum for his instruction alone—in India he pays little or nothing. In Hongkong they obtain men drawn from the right class; men who will be able to influence the financial side of engineering work. Again, in India most of the work is done under Government. In Hongkong business men are on the Council of the University, and a great deal of money has been subscribed to it from the business "Hongs," or firms interested in the trade of the Far East. Here there is a demand for native engineers; in India there is none. The native of India has no genius for work, while the Cantonese, or Southern Chinese, are born mechanics, and are both industrious and ingenious.

Many British engineers in the Far East are honestly alarmed at the training of these men scientifically, but China is a large country, and the immediate engineering requirements so enormous, that the problem will not become serious during the present generation. And in any case the Chinese mean to be trained in technology. If British engineers do not train them, other nationalities will. It is emphatically in the interests of Great Britain to develop the technological departments of the University, so that students will be attracted from all over the East to this Britsh Colony, where they will learn British ways and see and use British machines.

"There is, as is becoming only too well known as a result of experience, a great struggle among the nations for trade, especially in engineering equipment used for developing the national resources of new countries. What has already happened in Japan, South America and Africa were mere skirmishes; the pitched battle which will decide the question of trade supremacy will be fought in China.

"It may be taken as settled that in the near future neither British nor American nor German engineers will be employed by the Chinese Government either in construction or administrative work. The Chinaman is to fill these positions. Hitherto it has been the object of firms desiring to do business in China to place men of their own training in positions of influence there This system has been successful all the world over, and to some extent it has hitherto succeeded in the East. But the foreign engineers who now fill positions of influence in China are few, and those few

(*Continued on page 159*)



HONGKONG UNIVERSITY.—The Great Hall

POWER STATION AT BANGKOK

DESCRIPTION OF THE EQUIPMENT

The following interesting article appeared in the *Bangkok Times* of July 20:—

In two or three months' time the Government Power Station at Samsen will be completed, and the elaborate plant installed in running order. At present the Station is in a position to supply current, but a certain amount of work, of course, still remains to be done, and, considering the nature of the undertaking, as far as it has gone it has been expeditiously carried out. At the beginning of the year the buildings were in their embryo state, and it was not until the middle of April that the installation of the turbines was commenced.

When all is completed Bangkok will have a Power Station probably superior to any East of Suez as regards the up-to-dateness of the plant. The design of the buildings and the construction specified is of a kind which experts say could not well be beaten, and the plant throughout is of the very best and most up-to-date description. The turbo-generators and condensers, the latter with its turbine driven pumps, are the first of their kind in any station East of Suez and represent quite the latest practice in turbine work.

Naturally enough such work has not been done cheaply. From start to finish it will cost the Government a million and a half ticals. A million has already been spent, and Tcs. 100,000 was recently voted. Though some may hold that much the same result might have been obtained more cheaply, the Government rightly consider that it is better to have a thing done in the best possible way if the money is available, and in the present station there is certainly value for the funds expended. With careful and businesslike management the scheme will repay the outlay in a few years, and, in the course of years, be a source of considerable profit.

Besides supplying power for the Waterworks and the Opium Farm the Station will provide for the lighting of a large area where many of the Siamese Royalty and nobility reside, and we understand the area will be extended as the opportunity presents itself.

THE DESIGN

The design of the buildings and all the specifications for plant were in the hands of Mr. F. B. Shaw, the Electrical Engineer, and the care and foresight which he has displayed is worthy of all praise. Every contingency has been provided for, with due regard to local conditions, and the specifications were such that only two or three firms of world-wide repute were able to comply with the whole of them in their tenders.

The tender finally accepted was that of the A. E. G., and they are now carrying out the work with Mr. N. E. Duftie in charge, Mr. H. Scott being his second in command. The turbine expert is Mr. M. Potschke. Mr. Tennant is installing the switchboard for British Thomson-Houston Co., and Mr. Davies, representing the Tudor Cell Co., has just arrived to supervise the construction of the batteries. Babcock and Wilcox boilers have been installed by Mr. A. Rose, and Mr. J. T. Russell is in attendance as the representative of the firm. Mr. G. Kluzer has had the contract for building.

AN EXCELLENT SITE

The Department were fortunate in the first place in being able to secure an excellent site for the Station. Most important of all, it is on the river and close to the centre of distribution. Its situation is, in fact, the nearest point on the river from the Waterworks.

The most valuable principle of construction is that fuel can be got to the station above the boiler room without being touched by hand from start to finish. Two wharfs have been built where steamers can come alongside at all states of the tide, and immediately behind one is the big paddy husk store, paddy husk being, of course, the chief fuel to be used.

A steel paddy husk conveyor will lead from the river bank to the store, and, by means of a spiral in the conveyor worked by a motor, the husk will be conveyed from the hopper to the top of the store, in which a month's supply of fuel can be contained. It is a big building, and to the uninitiated looks big enough to contain sufficient fuel to withstand a fuel famine, but paddy husk is bulky. A second conveyor runs just underneath the roof, distributing the fuel along the building. A third conveyor runs from the middle of the building to the hopper erected over the boiler house, where a week's supply can be stored.

THE POWER OF CONCRETE

Reinforced concrete plays a large part in the construction of these buildings, as, indeed, it does throughout the station. In a number of cases ferro-concrete has been put to new uses, and the limits of this remarkably useful building asset have yet to be found. Mr. E. G. Gollo has been very successful in evolving new methods of employing it, and evidences of his ingenuity are to be seen throughout the Power Station construction.

The walls of the store house are curved inwards, as all the pressure will be from the inside, and it has only been necessary to make them of one brick thickness, Columns, beams, and cross-beams are of ferro-concrete, and the pressure is distributed to them.

The second wharf is connected with the main building by a railway, along which heavy material can be conveyed after being landed from the river. Running under the wharf is a steel pipe, 80 c.m.'s in diameter, so constructed that it is below the lowest water level. Connecting with the pipe is a tunnel, 1¼ metres high, and running underneath the foundations of the power house.

CONSTANT WATER SUPPLY

Thus there will be a constant supply of water for the condensers of the steam turbines, and it will first pass through a filter at the mouth of the tunnel. Thousands of gallons of water a minute will be required, but by the method employed a constant supply is assured with the minimum expenditure of energy.

The water, after being pumped through the condensers, is allowed to return by way of the boiler house, passing underneath the paddy husk furnaces, and thus carrying all the burnt paddy ash by a culvert straight out to the river. This culvert was provided for in making the foundations of the big husk store house. By being able to obtain a constant supply of water without pumping a big advantage is obtained over most stations, and it was only in building on absolutely virgin soil that such a result could be arranged for in construction.

The boiler house has an inverted roof of ferro-concrete forming the floor of the husk hoppers built over the boilers. The second store house has had to be very solidly constructed seeing that it is built over the boiler house, but by this method considerable space is saved, and the saving in labour eventually will be enormous. This design of Mr. Shaw's is ingenious, and it is the first time that husk hoppers in ferro-concrete have been constructed.

In this, the highest part of the building, are two tanks of water to supply the Grinnell's fire extinguishers which are to be installed. These extinguishers are capped with a special alloy of lead which melts at a certain temperature and allows the water to pour down. There is also a special motor pump for the supply of the fire hydrants at different points around the the buildings.

THE BOILER HOUSE

Coming next to the boiler house, Babcock and Wilcox boilers have been installed for the A. E. G. by Mr. A. Rose. There are sixteen steam drums, together comprising four batteries of boilers, and each independent of the other. While paddy husk is the primary fuel, liquid fuel, coal, and firewood can also be used, and all the furnances can be readily adapted for the use of any one of these. Liquid fuel will also be stored overhead, but only for use in the event of paddy husk giving out. Superheated steam will be used entirely for the steam turbines, the boiler pressure being 200 lbs. to the square inch. They have been tested up to 400 lbs. The heating surface of each battery of boilers is 6,480 square feet, while the heating surface of the superheater is 1,980 square feet. One boiler will be kept always for liquid fuel. The chimney in connection with the boilers is of steel, and one of the highest in Bangkok, being 162 feet from ground level and eight feet in diameter. Besides the boilers, Mr. Rose also supplied the conveyors for the New Conveyor Company, Ltd., Birmingham.

"KERNEL OF THE STATION"

Next to the boiler one comes to the whole kernel of the Power Station in the turbine room. The plant is of the most modern type only perfected about a year ago.

The condenser room, under the three turbines, is below the river level. The pumps here are driven by a small steam turbine, whereas in old plants pumps had to be driven by separate steam engines or electric motors. With the modern developments here employed all the generating plant is contained in a few cubic yards. The pumps will be working with a maximum of efficiency as the head of water will be the minimum possible.

One object aimed at in designing the station was to have one bank of boilers, one turbine, and one condenser complete, so that if the station were divided into three sections each would work perfectly well and independently of the other. Any part is interchangeable, so it is only necessary to keep spare parts for one set.

In the turbine room one first notices that there is no mass of steam piping to be seen. Here everything is below, so in the event of a pipe bursting no one can be hurt. It also has the effect of making the engine room much cooler. The engine room is a narrow building with big doors at each end, so that a strong current of air comes through.

THE TURBINES

The three turbines are of 1,000 kilowats each, and for their size are certainly the most efficient of the day. They are of the Multi-Stage Curtis type, entirely different to previous systems, and it has proved so successful in Berlin that it is spoken of as the system of the future. The plant includes the latest type of boiler feed pump driven by a small Curtis turbine, and capable of delivering water against a boiler pressure of 300 lbs. to the square inch.

The switchboard, thanks to the new devices employed, is largely automatic in action, and will not require constant attention. It includes an automatic device for regulating the voltage and keeping it steady. All the high tension gear (3,500 volts) is enclosed in a brick room at the switchboard. All the switches which operate the current are of the latest oil-immersed pattern with remote control. Each of the three turbines and the motor generator is controlled by a separate panel in the switchboard. A feature of the switchboard is the lightning resisters, which relieve the very high pressure caused by a flash of lightning striking the overhead wires and thus protect the generators from damage. Each generator has an instrument for integrating the number of units, so that the output of the station may be calculated exactly. It can also be indicated where any leakage takes place, and on what part of the line.

A large Tudor battery is being installed with a capacity of 2,600 amps. in five hours. There are 110 cells in the battery.

CONCRETE POSTS

It is worthy of note that all the posts to which the wires will be attached are of reinforced concrete, and are being made on the Station premises by Messrs. Kluzer and

(*Continued on page 159*)

MINING IN THE FEDERATED MALAY STATES

By Commercial Agent, D. C. Alexander, Jr.

Introduction

The Federated Malay States comprise the four Federated States of Perak, Selangor, Nigri Sembilan, and Pahang, and the three native States of Kedah, Kelantan, and Trengganu (recently ceded by Siam), having a total area of nearly 43,000 square miles. It may be expected that, in course of time, the now nominally independent State of Johore will also enter the federation. Each State is governed by a British Resident, in the name of the Malay Sultan; and Federal authority, both executive and legislative, is in the hands of a high commissioner, who is also governor of the Straits Settlements, and the Federal Council, all appointed by the Crown.

The development of the colony has been marvelous. In the early days tin mining was the only industry of importance, but in the past 10 years the cultivation of rubber has received almost equal attention, and in 1910 the area planted in rubber (295,000 acres) exceeded that under mining lease. Out of the very large profits of the miners and planters the State and Federal Governments have taken a heavy tithe in the form of export duties, but the sums so collected have been wisely expended in opening up the country by the building of roads, railways, and harbors. Of metaled roads there are now over 2,000 miles; while the Federal Railway has a mileage of about 650, which is being rapidly increased. Notwithstanding the heavy capital expenditure required by these improvements, the Federated Malay States are not only free of debt, but have a large surplus, out of which loans are made to planters, thus greatly assisting in the development of the country. Kuala Lumpur is the Federal capital.

Population—Importance of Mining

The population of the four Federated States is now about 850,000, Europeans numbering 3,000 to 4,000, Chinese and Malays each about 350,000, and Indians 150,000. The currency of the colony is the Straits Settlemen ts dollar, having a fixed value of 2s. 4d., or $0.5677. The standard of weight is the picul, equal to 133⅓ pounds, which is divided into 100 catties.

The importance of the mining industry in the Federated Malay States is shown by the export returns for 1910. In that year the total exports amounted to $58,111,380,[1] of which tin contributed $32,368,851, or 55.5 per cent. of the whole; gold $325,-950, or 0.56 per cent.; and wolfram, $26,781. Of the remain der, rubber constituted 26 per cent., leaving onlyabout 18 per cent. for all other exports. In 1911 the value of tin produced rose to $39,500,000, but as rubber also increased greatly the relative importance of the metals produced remained about the same as in 1910.

Gold Mining

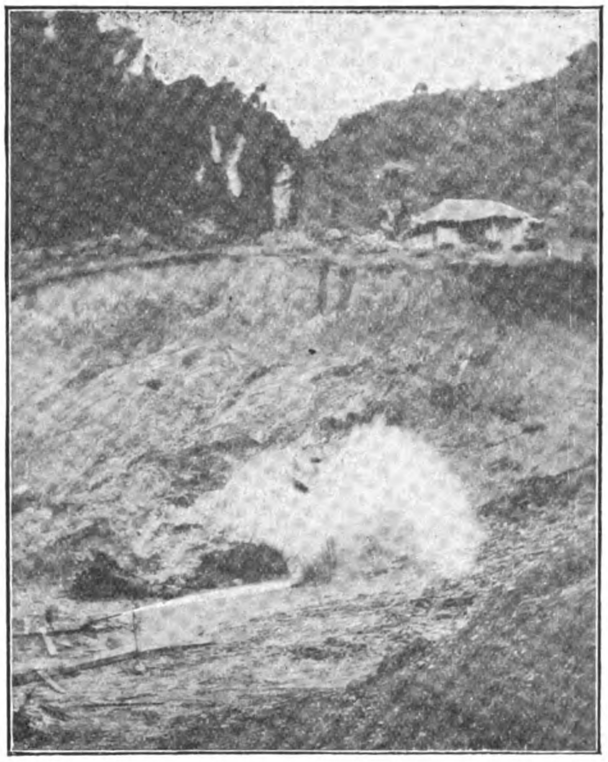
The production of gold in Perak in 1910 was 898.5 ounces, as compared with 1,278.8 ounces in 1909; Pahang, 15,868.5 ounces, against 14,887.7. Nigri Sembilan produced none in 1910 and only 76.9 ounces in 1909.

Nigri Sembilan having ceased to produce gold in paying quantities it is now mined in only two places, the Raub Australian Gold Mining Co., of Raub, Pahang, which in 1910 yielded 87 per cent. of the entire gold production of the colony, and in the alluvial workings of the Kuala Lipis district of the same State. The workings in Perak are on a very small scale, being principally in the hands of Chinese, who pan the river sands in several places. A large number of gold workings have been started at various times in Pahang, but in almost every instance the returns have been too small to justify their continuation, and they have been abandoned. However, none of these workings was carried to a depth of more than 500 feet, and should the test shaft which is now being sunk at Raub disclose new veins of paying ore, many of the workings now idle would doubtless be reopened.

[1] Values are in United States currency, unless otherwise stated.

The Raub Mines

The Raub mines, which are near the town of Raub, in the State of Pahang, consist of three shafts, Bukit Malacca, Bukit Koman, and Anderson. The first named has a depth of about 700 feet, and is to be sunk to 1,000 feet in the hope of discovering richer quartz than has yet been found. The writer visited only the shallowest working, the Anderson shaft, which has a depth of about 250 feet, and is being developed on only one level. The gold-bearing quartz lies in irregular veins 1 to 3 feet thick, surrounded by a close-grained black rock. The method of working is to open the drifts about 6 feet wide and 12 feet high, taking out the lower strata of quartz first, and then erecting a staging 6 feet above the drift floor. Chutes are let in through this staging, and the refuse from the upper part of the drifts and from the stopes is dumped through these chutes until the lower half of the drift is refilled.



Mining in the Federated Malay States.—
Hydraulic Sluicing

The labor underground is all Chinese and on a contract system, by which a Chinese contractor is paid at a fixed rate per ton for quartz delivered at the shaft bottom. The rate of payment could not be ascertained, but the contract is usually awarded to one of several bidders, and the rate varies with the nature of the workings and their distance from the shaft. In the Anderson shaft manual labor only is used for drilling and transporting ore and refuse, though a light railway with small trucks is provided. In the other shafts a few air drills are in use, but the tramming is done by hand.

Pumps—Mill Equipment

The mine pumps are, with one exception, of the old Cornish design, having a huge walking beam at the shaft head, from one end of which the wooden pump rod descends to the mine sump and operates a plunger in a long cylinder, the plunger and rods being counterbalanced at the surface. However, the usual steam cylinder at the surface has been eliminated, and the beam is actuated by an electric motor through a lay shaft and flywheel coupled to the beam by a connecting rod. The dimensions of the pump at the Anderson shaft are: Cylinder diameter, 16 inches; stroke, 14 feet; pump rod, 270 feet long by 10 inches in diameter. With an 80-horsepower motor, and at six strokes per minute, the pump raises 450 gallons per minute. While this efficiency is not high the mine engineer argues that this style of pumping is thoroughly satisfactory since neither the pump nor the motor requires the repairs that would be necessary for a pumping outfit placed in the mind.

When the ore trucks reach the surface they are hauled by light locomotives to the upper floor of the mill, where the ore is dumped over grizzlies into hoppers, and then passes to the rotary crushers. The crushed ore passes by gravity through other hoppers to the stamps each in a single row. From the mortars, which contain amalgamated copper plates, the pulp flows through a screen upon the amalgamated apron plates, thence to a mercury trap, and, finally, over the concentrating tables. The crushers, stamps, and tables bear the name of a Melbourne, Australia, engineering company. The plant has a complete outfit of tanks, etc., for cyaniding the tailings, but this has been found unprofitable and has been discontinued.

Power Plant

Power is supplied from a hydroelectric station, which has been erected by the company in the mountains some 6 miles from the mines. In this plant 500 horsepower is generated, the current being transmitted as two-phase alternating, at 5,000 volts, which is transformed at the mine to direct current at 220 volts. All the motors and transformers are from the Oerlikon factory, at Winterthur, Switzerland; the dynamo at the power station is from the same makers, while the water turbine is from Escher, Wyss & Co., of Zurich. In addition to the water-generated power, boilers and engines totaling about 100 horsepower are maintained at the mine. These are in small portable units and serve principally as stand-bys in case of accident to the electric plant. About 300 horsepower is consumed in pumping the three shafts, the remainder being used for the mine hoists and mill machinery. There are two single-cylinder belt-driven air compressors, with cylinders 10 inches in diameter and 12-inch stroke, from the Sullivan Machinery Co., of Chicago. Both are driven by one 30-horsepower motor and 80 pounds air pressure is maintained. These compressors are running very nicely, but are said to be inadequate, since most of their output is consumed at present in driving a large reciprocating pump in one of the shafts, leaving insufficient power for air-drills. However, it is expected that the air-driven pump will soon be replaced by one of another type, possibly a centrifugal, which will permit the use of a greater number of air drills. In the Anderson shaft there is no electric lighting, and the writer is not informed on this point regarding the other shafts.

Repair Shop—Labor—Output

As the mine is about 15 miles from the nearest railway and 50 miles from the nearest commercial machine shop, it is compelled to

maintain its own repair shop, which includes a small cupola, several forges, two or three lathes, and shapers and upright drills of various sizes. Almost without exception the machinists, as well as the workmen in the mill, are Malays. The total labor force of the mine is from 750 to 800 men, including the contract Chinese miners. Although exact figures are not available, the average rate of pay does not exceed $0.45 per eight-hour day for Chinese and $0.40 for Malays.

The output of the mine in 1910 was 14,555 ounces of gold, recovered from 55,137 tons of quartz crushed, an average of 0.264 ounce per ton. In 1909 the output was 14,510 ounces from 71,973 tons of quartz, an average of 0.2016 ounce per ton. From this it will be seen that, taking the value of gold at $19.40 per ounce, the yield per ton of ore crushed was $3.91 in 1909 and $5.12 in 1910. Considering the low cost of power and labor in the Raub mines, the net profit of the workings should be fairly large, since several gold mines in the Black Hills of Dakota have earned satisfactory returns from quartz yielding only $3.60 to $4 per ton.

Tin Mining

Tin mining is of vastly greater importance in the Federated Malay States than all other classes of mining combined, because of the widespread occurrence of the ore and the high commercial value of the tin. In 1910 a total area of 280,254 acres of land was leased for tin-mining purpose from the Federated Malay States Government, which retains ownership of all mining lands and leases them at a nominal rental, subject to Government inspection and regulation. The production of tin in each State is shown by the following table, in tons of 2,000 pounds:

States.	1910 Tons.	1911 Tons.
Perak	28,089.01	29,155.93
Selangor	16,012.78	15,411.65
Nigri Sembilan	2,315.17	1,948.69
Pahang	2,711.59	2,030.28
Total	49,128.55	49,446.55

In 1910 the average value in Singapore was $656.90 per ton, and in 1911 $796.65

NATURE OF DEPOSITS—QUARTZ

The tin is usually found in the form of cassiterite, an impure stannic oxide (SnO_2), and was undoubtedly originally deposited in the metamorphic granite of the mountains and hills of this region. Lodes of the ore are found in many places in the granite in the form of an onyx quartz, and the working of this quartz has been frequently undertaken. However, the quartz workings have seldom been successful, since the profit derived from them compares very unfavorably with what can be earned from even the low-grade alluvial deposits. It is generally held by mining engineers of this district that quartz workings will not become numerous or profitable until all but the very lowest grades of alluvial deposits have been exhausted, which will probably not be for another 25 or 30 years. Moreover, should large alluvial deposits of tin ore be found in the recently acquired Provinces of Kedah, Kelantan, and Trengganu, where prospectors are already at work, the day of the quartz working will be further postponed.

On the other hand, there are a few quartz deposits so rich that thoroughly experienced miners are not hesitating to erect the expensive mills necessary for working them. One such plant is that of the Menglembu Lode Syndicate, near Ipoh, in which 20 stamps and 5 concentrating tables driven by gas engines produced 196.4 long tons of tin in 1910 Another mill is now being erected near Bentong, Pahang, by Messrs. Ruxton and Bibbey, both miners of much experience in the Federated Malay States and Australia. Moreover, the Government of the Federated Malay States has very recently agreed to a proposal of the Mine Owners' Association that reductions of not more than 50 per cent. of the export duty on tin and tin ore shall be granted to miners who can show that the properties which they are working are of so low a grade that a reasonable profit cannot be earned if the full duty be exacted. As this measure will doubtless apply to mines in which the high cost of winning the tin leaves only a small margin of profit, it should have the effect of encouraging quartz mining.

ALLUVIAL DEPOSITS

The alluvial deposits of tin ore are very widely scattered, but the richest are usually found lying close to the slopes of hills or mountains, narrow valleys being most productive. This is easily explained on the theory that the disintegrated granite which contains the tin was washed down the slopes by rains and streams, and the tin ore, because of its weight, remained in pockets close under the slopes, while the sand that accompanied it was carried to a greater distance. That the streams in the valleys carried away the granitic sand and continuously deposited silt is shown by the fact that the richest ore is found in beds of clay. The famous and wonderfully rich Kinta Valley of Perak is an excellent example of the formation described and will for that reason receive special attention in this report. The valley is about 30 miles long, with an average width of 5 to 6 miles, and the hills on either side rise to an elevation of 300 to 400 feet. On the west side of the valley the granite of the hills slopes down until it meets the limestone floor, while on the east side of the valley the hills are flanked by cliffs of limestone outcrop. The Kinta, Sorakai, and several smaller streams flow through the valley. The richest ore deposits lie on the west side of the valley, but the east slope has what the west slope lacks—an abundant supply of water, by means of which the lower grades of ore can be profitably worked.

METHODS OF MINING

In times past a considerable amount of tin-bearing soil, or "karang" as it is called locally and will be designated hereafter in this report, has been raised by means of shafts, never exceeding 150 feet in depth and probably averaging not more than 50, and a certain amount is still so mined. But the opencast working has so rapidly superseded the shaft that the latter is now hard to find, except as old drifts are uncovered in mines that are now worked opencast. This is a natural outcome of the steadily increasing value of tin and the depletion of virgin karang. In 1895, when the price of tin was $280 per long ton, only the richest karang could be profitably worked, and this was most cheaply reached by shafting. When the ore bed began to decrease in richness it was abandoned and new workings started. However, 10 years later, when the price of block tin reached $850 per long ton, the mine owners realized the advantage of removing the overburden and carefully treating grades of karang that had been formerly despised. Moreover, virgin karang is now comparatively rare, and many mines are earning a good profit by reworking the dumps and tailings of old properties.

The following table shows the number of laborers employed in each class of tin mining in 1909 and 1910:

Class.	1909	1910
Opencast	137,156	122,686
Underground	18,198	19,154
Lampan..	28,024	28,521
Unclassified	1,321	......

Lampan mining may best be described as similar to the ground sluicing of the early California days, the method being to divert a portion of a small stream through a ground sluice, into which the karang is hoed and stirred by hand until the earth is washed away, leaving the ore in the bottom of the sluice. This method is confined to small surface workings, usually owned by Chinese who have too little capital to employ better methods. The remaining underground workings also are almost entirely Chinese mines, and many are worked without the aid of machinery, the karang being raised by means of ladders or hand windlasses. However, to prevent a mistaken impression, it should be noted that, while a majority of the Chinese-owned properties are worked by rather crude methods, some of the best-equipped mines in the Federated Malay States are owned and operated by Chinese, and that, according to the figures of the Senior Warden of Mines, 78 per. cent of the total output of tin in the year 1910 was produced from mines owned and operated by Chinese.

The methods by which the principal mines are worked may be classified as (1) opencast, (2) hydraulic, and (3) underground; and, for the purposes of this report, hydraulic mining will be subdivided into (1) natural power, and (2) generated power.

OPENCAST MINES

Opencast mines are by far the most numerous, since the class includes workings ranging from the tiny plots of "tributers," where one Chinese and his family pan out a few hundred pounds of ore in a year, up to the great Tronoh and Tambun mines, which hold the records for production. Needless to say, the amount of machinery used varies with the size and richness of the mine, but as even the largest employs no great plant, we may at once pass over the smaller ones and proceed to a consideration of typical mines and mills of major importance. The main difference in the larger opencast mines lies in the amount of power used and in the machinery for developing such power. The method and apparatus for treating the karang are practically the same in all mines. Therefore, before considering the subject of power and power plants, a description will be given of the typical ore mill which is to be found at every opencast or underground mine of considerable size.

ORE MILLS

In almost every case the karang is raised to the mill by means of small trams, which are hauled up inclines by winding engines. In the mill the karang is dumped upon grizzlies, and the clods are broken up by hand until the earth passes through, falling directly into the puddlers, which are circular tanks of wood or concrete, about 15 feet in diameter and 6 feet deep, with an inlet for fresh water, and an overflow pipe with screen set about 2 feet above the bottom of the tank. In the puddlers the karang is agitated by two or more harrows or "drags," suspended from four arms which rotate upon a vertical shaft set in the center of the tank. These vertical shafts are driven through bevel gears by a main shaft which passes close over the row of puddlers, a clutch permitting each puddler to be cut out for cleaning. A carefully regulated supply of fresh water being pumped into the puddlers, there is an equal overflow of slime, which passes through open troughs to the riffles.

The riffles consist of wooden troughs 4 to 6 feet wide, about 12 inches deep, and from 50 to 80 feet long, the incline being 1 in 25 to 1 in 30, depending upon the fineness of the ore which the mine is producing. At intervals of about 4 feet cleats are nailed to the sides of the trough, in which bars of hardwood are laid. These bars are usually 2 inches square in cross section, and as the deposit behind them gradually rises one bar is placed above another until the riffle is filled and has to be cleaned. Several riffle boxes are usually placed side by side under a thatched roof, and coolies pass up and down agitating the deposits with a kind of two-pronged hoe. It has been found that fully 90 per cent. of the ore in the karang is recovered in the riffles, in addition to which a small amount is often recovered from the tailings by tributers, a class of labor that will be described later.

When the riffles become filled, which may be once a week or once a month, depending upon the amount of karang treated, the supply of slime is cut off, the crossbars removed, and the deposit raked out. As it comes from the riffles the ore still contains a varying proportion of sand and other impurities, which are

removed by hand washing in pans, No. 60 being the usual mesh of the screen. This washing is done by coolies over coffin-shaped boxes with a small flow of clean water, several traps being provided to catch the finest particles before the water is finally wasted.

In most alluvial mines small amounts of ore are occasionally found inclosed in quartz pebbles, which remain in the puddlers and must be crushed before further treatment. For this purpose some of the large mines maintain a small battery of four or five stamps of the gravity type, but the crushing is more commonly done in a kind of mortar (introduced by the Chinese) in which the crushing shoe is hung at the end of a beam, which rests on a fulcrum and is actuated by the foot power of coolies. From the stamp the crushed material goes to the washing pans.

The clean ore is dried in a perforated cylinder placed around a cone-shaped stove, which may be fired with coal, wood, or charcoal. If the ore is known to contain any considerable amount of wolfram this is then removed by ordinary horseshoe magnets, which are passed over thinly spread layers of the ore and finally the ore is sacked, 1 picul (133⅓ pounds) to a sack, and stored until shipped to the smelter.

POWER SUPPLY

Power is required for (1) drainage pumps and fresh-water supply pumps; (2) moving karang and overburden in the mine and to the mill; (3) mill operation, such as driving puddlers, stamps, etc., and dynamos; the latter usually lighting only, since practically no motors are now in use in the opencast mines.

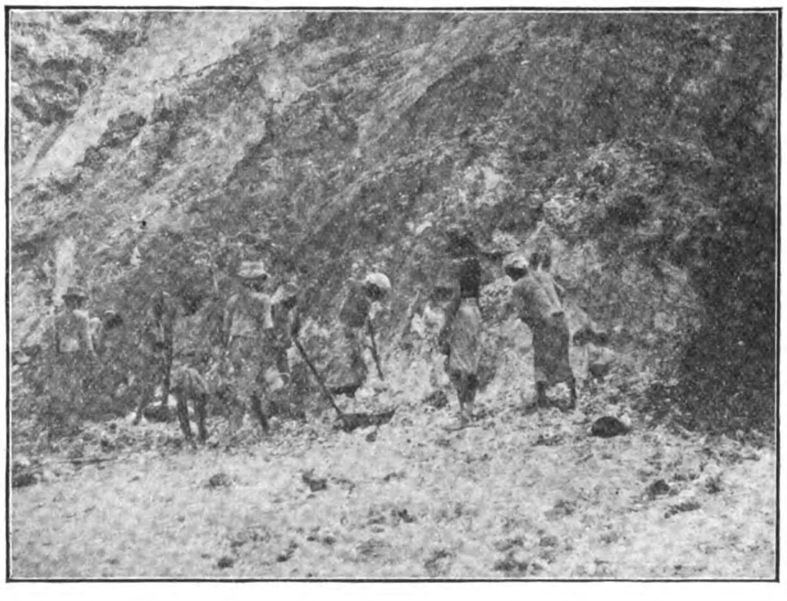
In the small mines many of these services are performed by man power, as, for example, the operation of the Chinese type of stamps already described, or the transportation of the karang to the mill on the backs or heads of coolies. Moreover, many Chinese pumps are still seen in operation, both for drainage and to supply water to puddlers and riffles. Because of their widespread use, these Chinese pumps deserve description. They consist of an endless chain of wooden floats strung about a foot apart upon two ropes. The floats fit snugly in a long, inclined wooden trough, which rises from the sump to the surface at an angle of 30° to 45°. At the surface the floats pass over a large wooden drum and empty into a discharge trough. The staves of the drum, which is 6 to 12 feet in diameter, are spaced 1 to 2 feet apart and, upon the outside of this endless ladder, one or more coolies climb like squirrels in a revolving cage, turning the drum by their weight. As the maximum lift of such a pump is only about 30 feet it becomes necessary, when the water must be carried to a greater height, to place them in stages, one pumping to another. Even with the low wages that prevail in the Federated Malay States this method of pumping is recognized as expensive, and power pumps are rapidly displacing these antiquated devices.

Ten years ago the best-equipped mines generated all their power in small steam units, one for the drainage pumps, one for the supply pumps, one for each winding engine, and one for the mill; and even to-day a majority of the larger mines are so equipped. But with the rapidly increasing cost of wood for fuel the gas producer and gas engine came into use and they are now to be found in most of the up-to-date mines. The cost of this power varies with the cost of coal, which, since none has yet been mined in the Federated Malay States, must all be imported. A few plants are run upon Welsh anthracite, which costs laid down in Ipoh $16 to $17 per ton; others use semianthracite "Hongay" from China, costing $11 to $12 per ton. A majority use, both in producers and under boilers, the very poor Bengal or Borneo coals, which can be had at $5.50 to $6.50 per ton delivered in Ipoh.

MINING IN THE FEDERATED MALAY STATES.—A Power Installation

SMALL UNIT INSTALLATIONS—OIL AS SOURCE OF POWER

It is surprising, however, to note that even when the producer and gas engine are employed they are generally in small units and are largely supplemented by steam power. Since the power in any mine must be widely distributed, it would seem that the economy of central electric stations and motor-driven pumps and machinery would be quite apparent, and the arguments of the mine owners against them are of interest. They say that, in the first place, the richness of a given mine or tract of land cannot be ascertained in advance, as the karang does not run in well-defined veins, and test borings are of little value. Therefore, even if the first workings disclose rich earth, no one can foretell how soon it will be exhausted or what the life of the mine will be. For this reason owners decline to risk the initial expense of central power stations. The total cost of the small units required under present methods may be as much as as that of a central power station with the necessary motors; but it is argued that these small units can be purchased from time to time as the mine justifies the expense, and that when the mine is exhausted they can be readily sold or transferred to other workings.



MINING IN THE FEDERATED MALAY STATES.—Open Face Working

Another argument against the large electric plant is that the Chinese and Malay engineers who operate the small steam and gas plants (and these only indifferently well) would not be competent to keep in order a large electrical installation. Moreover, the great fluctuations that have occurred in the price of tin must be considered, as many mines making a fair profit at present prices would have to close down should the price of tin drop 25 per cent.

In spite of all these objections, the writer believes that the central electric station, generating from 200 horsepower upward, will be the next feature of opencast mine improvement in the Federated Malay States. It may also be confidently predicted that oil will soon become the chief source of power in the mining district, as it is fast becoming in the rubber-growing fields. When one considers that the enormous oil fields of Sumatra, Java, and Borneo are within 300 miles of Ipoh, he is amazed to find that in 1910 only 6 tons of fuel oil were imported into the whole State of Perak. In the same year Selangor, the principal rubber-producing State, imported 1,545 tons and Pahang, where wood fuel is still cheap, 1,801 tons.

TYPES OF BOILERS AND ENGINES IN USE

Of the small power units generally in use the boilers are almost invariably of the portable type, 20 to 50 horsepower, and carrying 50 to 80 pounds working pressure. These supply steam to the winding engines, the mill engines, and in many cases to reciprocating steam pumps for drainage or riffle supply; but for pumping service the combined portable boiler and engine, driving a centrifugal pump, is largely employed. The centrifugal pumps range from 2-inch to 6-inch, depending upon the quantity of water to be handled, and are always single stage, as the discharge head never exceeds 175 feet.

The winding engines are usually of the horizontal duplex type, cylinders 6 by 10 inches to 10 by 18 inches, with drum 3 to 5 feet in diameter. The steam engines used for driving the mills are, of course, of many different makes and sizes, but with very rare exceptions they are simple, slide-valve, non-condensing engines, generating 30 to 60 horsepower.

As has been mentioned, the best equipped mines are now driving their mills (but seldom their pumps and winding engines) from producer-gas engines. All the producers and engines that the writer has seen in the mines visited are from three makers—Fielding & Platt, of Gloucester; the Hornsby-Stockport Co; and Ruston, Proctor & Co.—all English makers. The producers are of the suction type, with wet and dry scrubbers, and most of the engines are of the single-cylinder four-cycle design, generating 30 to 60 brake horsepower. The units are frequently installed in duplicate to provide against breakdowns and to permit of alternate cleaning in mines that operate continuously. Mine

managers speak highly of these outfits, and the Chinese and Malay engineers appears to run them with little difficulty and few accidents. The writer saw no oil engines at any of the mines visited. though informed that in the Kuantan mine, in Pahang, Diesel engines, aggregating 245 horsepower, are in use and are proving very satisfactory To illustrate the above general description, detailed accounts follow of two well-known opencast mines.

THE TAMBUN MINE

The Tambun is often called the "show mine" of Perak, because its owner, Towkay Leong Fee, not only welcomes visitors, but keeps his property in such perfect order that one might almost think it was maintained purely for their benefit. That such is not the case is proved by the fact that the Tambun has held (and probably still holds) the record for a year's production, its output in 1907 or 1908 having been 3,600 long tons of ore. At present the owner is voluntarily curtailing production by working his mine on a nominal eight-hour day, whereas most other mines are running continuously day and night. While leaving the question of labor for later discussion, it may be said that in most opencast mines the karang and overburden are raised from the mine either by contract or by piecework. In the Tambun mine the raising of 80 trucks of spoil for each man in a gang constitutes an eight-hour day for Chinese laborers, and for this amount each is paid $0.33. If by rapid work or by working overtime the gang exceeds the average of 80 trams per man, the pay is increased pro rata. This explains why the tram pushers in the Tambun are usually seen moving at a run. About 700 Chinese are employed and 200 Indians; the latter all Tamils and Punjabees. As the Indian does not equal the Chinese as a workman his pay is proportionately less, being $0.255 per eight-hour day.

EQUIPMENT OF TAMBUN MINE

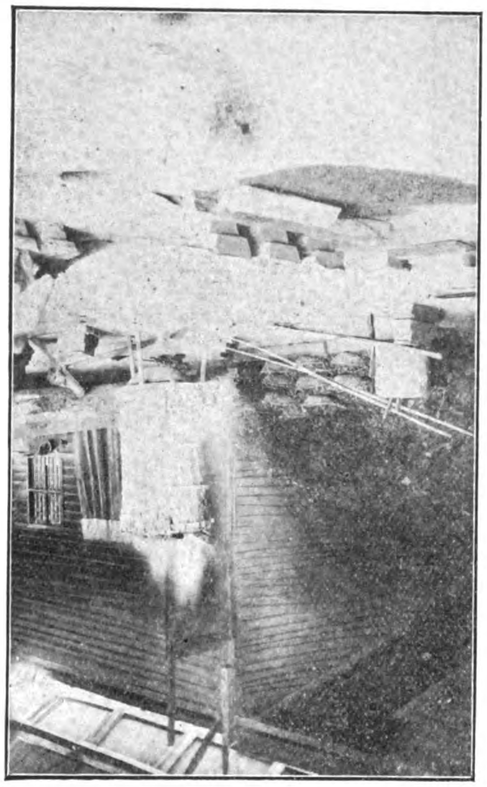
For raising spoil there is a light railway and trams, but no locomotives; three inclines, two of which are employed for the removal of overburden, each with double tracks; and three winding engines with continuous steel cables, so that descending empties partially counterbalance loaded trams ascending. These winding engines, from Ransomes, Sims & Jeffries, of Ipswich, England, are simple duplex, with cylinders 10 by 18 inches. They are supplied with steam at 60 pounds pressure, from four portable boilers built by the Wantage Engineering Co., Wantage, England.

The drainage pumps are one 8-inch and two 6-inch centrifugals, driven by portable combined boilers and engines from Ransomes, Sims and Jeffries, and pumping against a total head (suction and discharge) of about 60 feet. The fresh water service for puddlers, riffles, etc., is maintained by a very neat little pumping station, in which power is generated by a 35-horsepower single-cylinder four-cycle gas engine, supplied by two suction producers which are operated alternately. Engines and producers are from the shops of Fielding and Platt. The impellers of both pumps, which are 6-inch centrifugals from Gwynnes (Ltd.), of Birmingham, are mounted upon the same shaft, each with a clutch, so that they can be run singly or in pairs. They are pumping against 35 pounds head. The mill contains four primary and six secondary puddlers constructed of concrete. This is the only mill the writer has seen in which puddling is done in two stages. The arms of the puddlers are driven through the usual shaft and bevel gears by two producer-gas engine sets of 35-horsepower each, duplicates of the set in the pumping station, and from the same makers. When all the puddlers are in use both engines are required. As lighting for night work is not needed, no dynamo is operated.

Since the Tambun has its own smelter, a small mill for coarse concentration is maintained. This consists of one 5-foot Huntingdon mill, manufactured by Davey, Paxman & Co., of Colchester, England; a set of four standard revolving trommels (pitch 1 inch to 1 foot); and four four-compartment Hartz jigs, each taking the feed from one trommel. There is also a small concentrating table of the Overstrom type; the whole mill is driven by a small steam engine.

CHINESE SMELTER

The smelting plant is of a simple Chinese type, but gives very satisfactory results. Five furnaces are in use, charcoal being used as fuel and a small amount of limestone as a flux. The blast for each furnace is maintained by a coolie, who pushes and pulls a square, single-acting piston in a wooden box 5 to 6 feet long. The intermittance of this blast does not seem to be detrimental to the smelting process; indeed, the results were not so good when a rotary blower was installed a short time ago. The Chinese attributed the unsatisfactory working of the mechanical blower (which was probably due to mishandling for the purpose of securing the reemployment of the dismissed blower coolies) to the fact that the supply from the rotary fan was not the same kind of air as that derived from the hand-power blowers. The slag trickles down into an iron receptacle, where the scum is removed by a strainer and returned to the furnace; the clean molten tin is then ladled into the molds. Although the Tambun is the only mine the writer has seen that smelts its own ore, there are many small Chinese smelters scattered about Perak, which somehow manage to run in competition with two large well-equipped, European-style smelters in Singapore and Penang.



MINING IN THE FEDERATED MALAY STATES.—A Typical Chinese Smelting Furnace for Tin Ore

In 1910 there were removed from the Tambun mine 684,730 trucks of overburden and 250,703 trucks of karang, from which 621 long tons of ore were recovered.

THE LAHAT MINE

The Lahat mine resembles in general features the Tambun, except that the workings are long and narrow, for which reason the company has installed two small locomotives for moving karang and overburden in the mine; the spoil is raised to the surface on the usual incline by a steam winding engine. There being an insufficient supply of fresh water for the puddlers and riffles, it has been found necessary to pump the drainage water into shallow ponds, from which, after the mud has settled, it is pumped to the mill and riffles. When this supply is not sufficient, as sometimes occurs when the rainfall is below normal, the water from the riffles must be likewise impounded and used again after the tailings have settled out. The drainage pump is a large duplex affair fed by a portable boiler. Coal for this boiler is handled on an aerial ropeway.

The puddlers, riffles, and washing sluices are similar to those already described. The power plant is equipped with a steam engine and boiler, and with a 120-horsepower duplex four-cycle gas engine, running at 200 revolutions per minute, which, with two producer outfits of 160 nominal horsepower each, are from Fielding and Platt (Ltd.). The producers, which are run on Welsh anthracite, are operated alternately, and the steam plant is reserved as a stand-by. As the mill is run continuously, an ingenious arrangement has been made for quickly cutting in the steam engine in case of trouble with the gas engine or plant. By this arrangement the crank shaft of the steam engine is used as a lay shaft, the gas engine being belted to a pulley on one end, while the main belt to the mill runs on a pulley at the other end. This device has been found very convenient, though a small amount of power is wasted in keeping the steam engine's piston and connecting rod in motion when steam is not up.

In addition to furnishing power for the puddlers, which absorb 10 to 15 horsepower each, the plant drives a 5-horsepower dynamo for lighting and also two centrifugal pumps that supply the puddlers and riffles. These pumps, which are from Gwynnes (Ltd.) have a capacity of 1,250 gallons per minute each, and their impellers are mounted on the same shaft, each with a friction clutch.

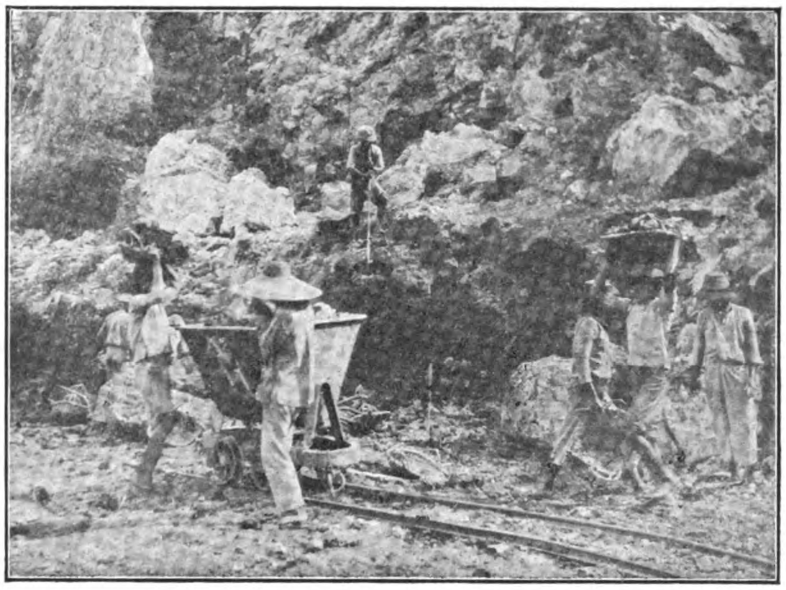
OUTPUT OF LAHAT MINE—LABOR

In 1910, 298,000 cubic yards of spoil were raised from this mine, of which 65,000 cubic yards were overburden, and 548 long tons of ore were recovered. The Lahat ore averages 74 per cent. pure tin, which is rather higher than the average for the whole mining district. At the present time about 700 men are employed and 22,000 cubic yards per month are being raised, from which 36 to 38 long tons of ore are secured. The spoil is moved by contract with Chinese and Tamil foremen, the former receiving 7.9 cents and the latter 6.8 cents per truck of 20 cubic feet delivered in the mill. The difference in rate of pay is due to the fact that the company supplies the Tamils, but not the Chinese, with tools, and also that the compulsory contribution of the company to the Tamil immigration fund, described later, amounts to a charge of about 1.1 cents per cubic yard. The Chinese work 8 hours per day, 4 on and 8 off, while the Tamils work one shift of 6 hours in the 24 and have their time so arranged that once in each week they have a whole day free.

Before leaving the subject of opencast mines, it should be mentioned that the omission of a description of the most famous opencast mine in the Federated Malay States—the Tronoh—is not due to an oversight, but to the fact that permission to visit these workings was conditioned on a promise that a detailed description of the plant should not be published. The mine was formerly worked by means of shafting, but the overburden has now been removed and the workings are all opencast. Nearly 6,000 men are employed, and in 1911 the Tronoh broke all records by a production of 2,083 long tons of ore in four months.

NATURAL-POWER HYDRAULIC MINES.

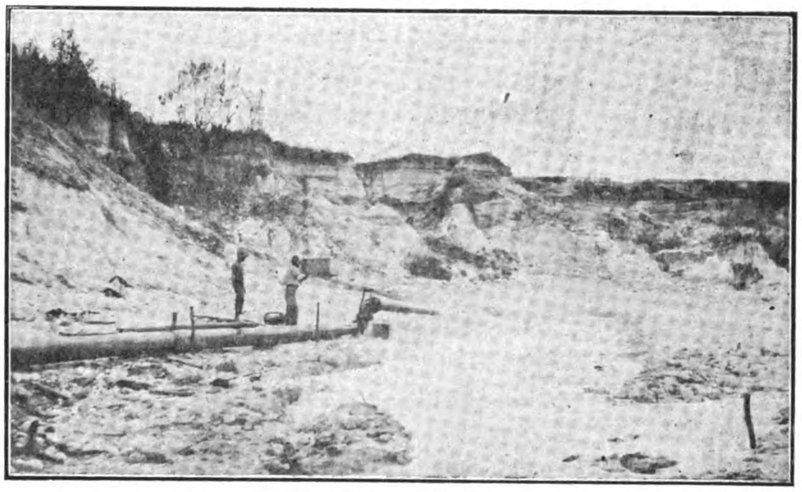
Natural-power hydraulic mines are found in almost every section where a good supply of water can be secured under a gravity head of 100 feet or more, since by this method very low grades of tin-bearing earth can be profitably treated. There are included in this class the Tekka, Old Gopeng, New Gopeng, Kinta Association, and Kinta Limited, in Perak; the Serendah, in Selangor; and the Kenaboi and Seremban, in Nigri Sembilan. However, as the method of working and the plant employed are almost identical in every mine of this class a description of one will answer for all,



MINING IN THE FEDERATED MALAY STATES.—Open Face Mining

and for this purpose the Tekka, the largest and best known, affords an excellent illustration.

The Tekka lies on the east side of the Kinta Valley, where the limestone substratum is pushed up into cliffs. The water supply is brought from the hills, under a pressure of 65 pounds to the square inch, and is distributed to the monitors through 10-inch riveted steel piping which has been tested to a pressure of 100 pounds per square inch. As these pipes are made in 20-foot lengths and are joined only by a taper joint, they are easily shifted. The monitors consist merely of steel pipes 6 to 8 feet in length and 4 to 6 inches in diameter, with a swivel joint and mounted on a wooden stand, the nozzle usually being 2 inches in diameter. There are now eight monitors in operation in the Tekka mine, utilizing a total of about 1,500 cubic feet (11,200 gallons) of water per minute.



MINING IN THE FEDERATED MALAY STATES.—Monitor at Pangkalen Mine blowing Earth towards the Intake of the Gravel Pump

The monitors cut down the tin-bearing earth and blow it up to the elevators through trenches prepared for that purpose. In the Tekka and most other mines of this class the deposit in these trenches is given a preliminary washing by hand, a large amount of ore being quickly and easily secured in this way. This washing is done principally by women, in slightly dished wooden trays, the drainage from the monitors being used for the washing. It should be noted here that in hydraulic mines no distinction is made between karang and overburden, as all the earth removed by the monitors is treated equally.

HYDRAULIC ELEVATORS—COST OF PRODUCTION

The hydraulic elevators, of which there are two at Tekka, are for the purpose of raising the earth to the riffles, which must be sufficiently elevated to allow for the proper disposal of the tailings. These elevators are installed at the lowest levels in the workings, and a pit, or sump, is dug to receive the earth blown up by the monitors. The principle of the elevator is, of course, very simple, the earth being drawn up from the sump by suction, and carried to the top by the pressure of the injection water. As the injection water is under a pressure of about 65 pounds to the square inch, and the resulting erosion is considerable, the elevator pipes are made of cast steel, flanged and bolted. The height of the elevator depends principally upon the level of the ground on which the tailings are to be deposited, 30 to 50 feet being the usual elevation. While the mechanical efficiency of the hydraulic elevator is very low, this is of small importance, since the amount of water needed to wash a given quantity of earth in the riffles is almost the same as that required to raise the same quantity of earth through the elevator. The water is thus made to do the double duty of first raising and then washing the karang.

The riffles at the Tekka and other hydraulic mines are of exactly the same design and construction as those described for opencast mines, except that they are usually somewhat longer, since the karang, which the elevator discharges directly into the riffles, lacks the thorough preliminary sliming that a puddler provides. The final washing, drying, extraction of wolfram, packing, and smelting of the ore are the same in hydraulic as in opencast mines.

The low cost of working a hydraulic mine is best illustrated by a comparison of the Tekka with the Lahat mine. In the latter 700 men and 300 horsepower of prime movers (not to mention two locomotives) in 12 months raised 298,000 cubic yards of earth, of which 232,811 cubic yards were treated. In the Tekka mine only 300 men and no fuel-generated power were required to raise and treat an estimated quantity of 840,000 cubic yards in the same period. Estimates by the mine managers of the cost of raising and treating the tin-bearing earth in three different mines are as follows: Lahat (opencast), $0.52 per cubic yard (overburden not included, $0.485); Tambun (opencast), $0.34 per cubic yard; Tekka (hydraulic), $0.07 per cubic yard.

Aside from a few coolies engaged in hand tramming, labor in the Tekka mine is paid by time; the Chinese receive $0.335 to $0.36 and Tamils $0.205 per eight-hour day. In 1910, 438 long tons of ore were recovered.

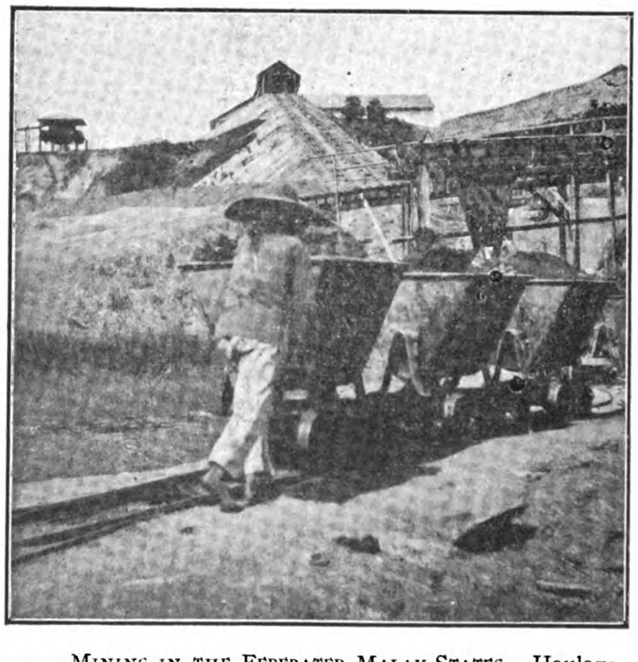
Generated-Power Hydraulic Mines

Generated-power hydraulic mines resemble those of natural-power hydraulic mines in that the tin-bearing earth is cut down and blown to a central sump by monitors; but the water pressure must be generated by pumps and the earth raised to the riffles by gravel pumps, instead of by the hydraulic elevators used in the natural-power mines. The largest and most modern of the generated-power hydraulic mines is the Pengkalen, which is situated in the Kinta Valley, near Ipoh.

Its central electric station is equipped with three 400-horsepower Babcock & Wilcox water-tube boilers and two Bellis & Morcom's high-speed vertical compound condensing engines, each direct coupled to a 500-kilowatt dynamo from Crompton & Co., of Chelmsford, England, generating three-phase alternating current at 2,200 volts. Both Australian and Natal (South Africa) coals are used under the boilers. To increase the capacity of the plant, orders have recently been placed for a fourth boiler of 400 horsepower, automatic chain stokers for the whole battery of boilers, and a mixed pressure turbo-generator set of 600 kilowatts from Fraser & Chalmers (Ltd.). The pumping station which supplies the monitors contains two single-stage 12-inch Worthington centrifugal pumps, each direct coupled to a 280-horsepower motor and having a capacity, at 740 revolutions per minute, of 3,000 gallons per minute at a pressure of 65 pounds per square inch. Six monitors with 2-inch nozzles are now in use, and the number will be increased as soon as the new power machinery is installed.

GRAVEL AND DRAINAGE PUMPS.

The third and most interesting division of the works are the gravel pumps, of which there are three in different parts of the workings.



MINING IN THE FEDERATED MALAY STATES.—Haulage incline at Tambun Mine; mill at top. The trams in foreground have capacity of 20 cubic feet each

Each is placed upon a steel barge so that when the mine face becomes too distant the pumps can be moved to a new position by simply flooding one section of the mine and floating the barge to the desired point. However, as each movement of the barge necessitates changing the piping, and often the location of the riffles as well, a barge is usually shifted not more than once or twice in a year. The illustration shows one of these barges, covered over with corrugated-iron sheets. The pipe seen in the foreground is the intake of the gravel pump, while the discharge pipe, leading to the elevated riffles, is shown upon the right, carried upon bamboo scaffolding. The total suction and discharge head is about 60 feet.

The Pengkalen gravel pumps, which are from the Australian Otis Engineering Co., of Melbourne, are 15 inches in diameter, with three-wing rotors 36 inches across. Notwithstanding that both rotors and liners are of cast steel (the former with cast-iron shoes) the erosion is so rapid that the life of a liner is usually not more than three months. The gravel pump is driven by a 12-strand wire-rope drive from a 350-horsepower motor, which is of Messrs. Cromptons' manufacture, as are all other motors in this mine. The suction and delivery pipes of the gravel pumps are 12 inches in diameter, of welded steel, flanged and bolted; the supply pipes for the monitors are the 10-inch riveted steel pipes with taper joints previously described.

The fourth division of the Pengkalen plant includes the drainage pumps, of which there are two, one 12-inch centrifugal with 85-horsepower motor and one 7-inch centrifugal with 20-horsepower motor. Another motor of 35 horsepower drives a 220-volt direct-current dynamo for lighting.

OUTPUT AND COST OF PRODUCTION.

In the Pengkalen mine 776,000 cubic yards of earth were treated in 1910 for a return of 392 long tons of ore, but recently the working time has been shortened and the average treated is now about 30,000 cubic yards per month of 25 working days. Only 50 laborers are employed, most of them Chinese, who receive $0.40 per eight-hour day.

The estimated cost of raising and treating the earth in this mine is about $0.315 per cubic yard, nearly five times as much as in the Tekka natural-power hydraulic mine. This great difference, which is due to the high cost of steam-generated power as compared with natural hydraulic power, makes such plants as the Pengkalen out of the question on low-grade ground. It seems quite probable that lower costs might be attained in generated-power hydraulic mines by the use of producer-gas engines, or, even better, oil engines of the Diesel or similar type. The Sungei Raia Co., of Perak, is operating a hydraulic plant driven by producer-gas engines using Chinese coal, but information regarding their costs is not at hand. So far as the writer can learn, there are at present no generated-power hydraulic plants in the Federated Malay States driven by oil engines.

The foregoing constitute the established methods of tin mining in the Federated Malay States. It is reported that a French company has placed an order for a steam dredge of the ordinary bucket type, to be used in Perak for tin dredging, but local engineers are skeptical as to the feasibility of this method, and it is not likely to be extended until the first dredge has had time to prove itself.

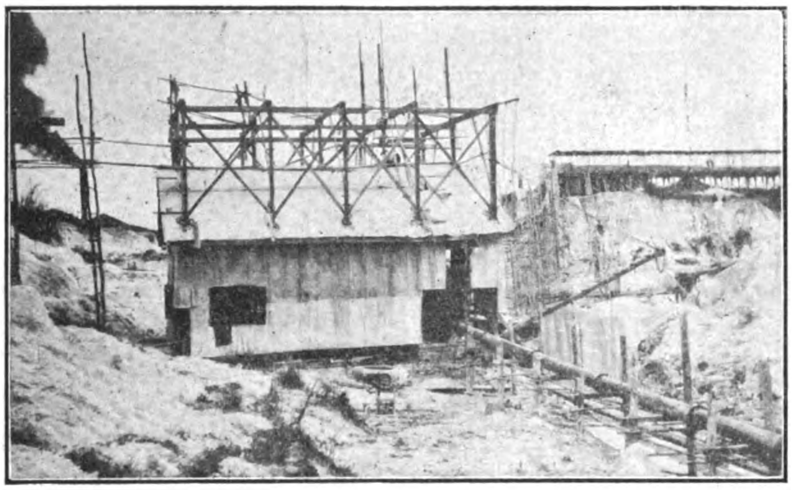
Smelting

The two plants which smelt most of the tin ore produced in the Federated Malay States are situated in the Straits Settlements, one in Singapore and the other near Penang. There is also a small European-owned smelter in Ipoh, but owing to the noxious fumes given off its operation has been discontinued. Therefore, it may be assumed that all the block tin exported from the Federated Malay States is the output of Chinese smelters, similar to the one described in connection with the Tambun mine. This output of block tin is shown by the following figures from the reports of the Senior Warden of Mines:

Years.	Total export ore and block.	Block tin.	Proportion of block to total.
	Long tons.	*Long tons.*	*Per cent.*
1909..........	48,743.3	10,749.1	22.05
1910..........	43,865.0	9,780.7	22.29
1911..........	44,148.5	9,846.5	22.30

The total export figures represent 70 per cent. of the gross weight of the tin ore, which is the proportion of pure tin to tin ore fixed by the Federated Malay States Government for taxation purposes.

It is said that over 80 per cent. of the tin ore exported from the Federated Malay States is smelted either in the smelter of the Straits Trading Co. at Singapore or that of the Eastern Smelting Co. at Penang; these smelters also received a small amount of ore from Australia and South Africa. Such of the Federated Malay States ore as is not smelted in the Straits Settlements goes to England, the following provision of the customs tariff making it impossible to ship the ore to other countries for smelting: "Export duty, tin ore, 70 per



MINING IN THE FEDERATED MALAY STATES.—Barge carrying Gravel Sand at Pengkalen Mine; Riffles to the Right

cent. of the duty on tin with, in the case of tin ore exported otherw... se than under such guarantees as the Re^ident may require that it shall be smelted in the Straits Settlements or United Kingdom, an additional duty of Straits $30 per picul ($285 United States currency per long ton)."

The export duty on block tin, provided by the same tariff, is Straits $10 per bhara (400 pounds) when the price of tin does not exceed Straits $41 per picul; but when the price exceeds $41 per picul the duty per bhara is increased by $0.50 for every $1 by which the price of tin exceeds $41 per picul. At the present (Feb. 22, 1912) price of Straits $96.50 per picul in Singapore, the export duty amounts to Straits $38 per bhara, or $109.25 United States currency per ton of 2,000 pounds. In 1910 this duty alone yielded the very handsome revenue of $4,002,668 United States Currency.

CHARGES FOR SMELTING

The smelting companies buy the ore outright from the producers, after the quality has been determined by assays made at the mine by the smelter's assayer. The charge for smelting can, therefore, be quite accurately estimated from the difference between the price which the miner receives for his ore and the market price of block tin on the same date, the percentage of tin in the ore being known. The managers of four mines gave the following as their charges for smelting, the term being used in the sense explained above:

Mines.	Charge per picul.	Charge per short ton.
	Sts. dolls.	
A....................	2.37	$20.11
B....................	2.16	18.19
C....................	2.32	19.66
D....................	2.24	18.98
Average........	2.27	19.23

The difference in the charge for different mines is partially explained by the fact that the price paid the owner is usually for the ore delivered at the nearest railway station, the smelting company paying freight charges to the smelter. The published railway tariff for tin ore is one-half cent Straits currency per mile per picul for the first 50 miles, and one quarter cent per picul-mile for each subsequent mile up to 150, after which it becomes one-eighth cent per picul-mile for each subsequent mile. Therefore mine A, which is, say 122 miles from Penang, will find its smelting charges 1 cents per picul higher than mine B, which os, say, only 82 miles from Penang. Assuming the distance from Ipoh to Penang (112 miiles) to be the average distance the ore has to be shipped to the smelter, then the smelting company's gross profit is at once reduced by 40½ cents Straits currency (plus wharfage charges at Prai) per picul, leaving $1.80 to $1.90 Straits currency for the actual cost of smelting, marketing, and profit. At the present price of tin, $96.50 Straits per picul, this net charge amounts to 1.8 to 2 per cent. of the market price of block tin.

Labor Conditions

The total labor force in the Federated Malay States tin mines in 1910 was 170,361, a decrease of 14,340 as compared with 1909. In 1911, however, the labor force totaled 196,300, a considerable increase over any previous year. In addition to the number given, 10,257 women and children worked in the mines in 1910 under "dulang" passes issued by the Government, but as their employment is not continuous they are not included in the regular labor force. The number employed under various systems in 1910 was as follows: Contract, 47,480; wages, 22,921; tribute, 99,960; dulang, 10,257.

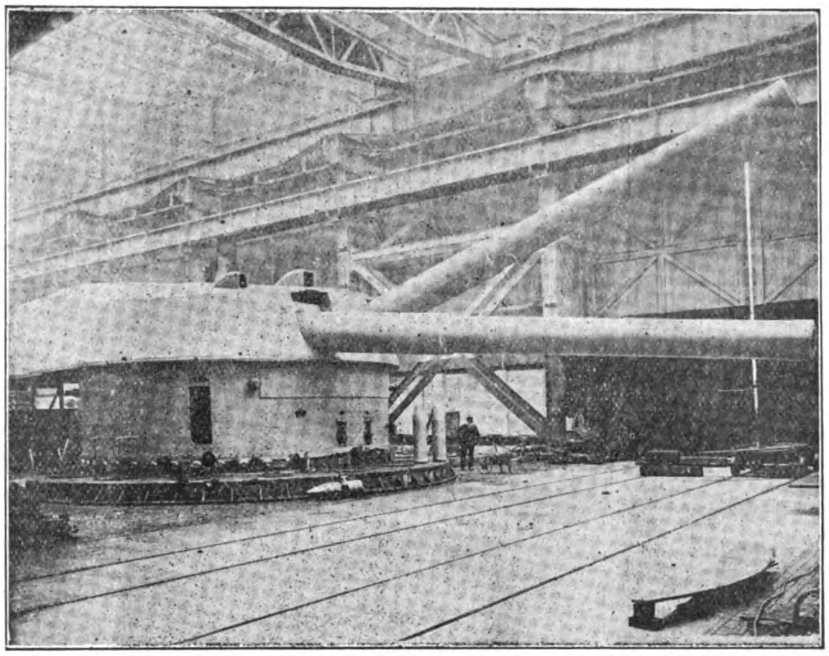
Under the contract system the laborers receive, either direct from the mine manager or from the Chinese foreman who employs them, a fixed amount for each truck of karang or overburden raised from the mine, as in the case of the Tambun and Lahat mines. This system has been found much more satisfactory for mine coolies than a fixed daily wage, since it prevents "soldiering." On the other hand, it is obviously impossible to fix a contract rate for mill hands or for the laborers in hydraulic mines, hence they must be paid by time.

At the height of the tin boom in 1906, when tin was selling at $860 United States currency per long ton, the general eight-hour wage for Chinese laborers reached $0.51, but during the heavy slump in price which followed in 1907-8 the mine owners, by unanimous action, cut this rate to $0.34. With the steady increase in the price of tin since 1908 wages for both Chinese and Tamils have gradually increased until, as has been shown, the present eight-hour wage in European-owned mines ranges from $0.34 to $0.40 for Chinese and from $0.225 to $0.26 for Tamils. This increase has been partly due to the growing demand for labor on the rubber estates, but this demand has not affected the supply of mine labor so much as would be expected, since the rubber planters find Tamil labor more suited to their requirements than Chinese and usually arrange to obtain Tamils direct from India instead of attempting to draw

(*Continued on page 150*)

THE COVENTRY ORDNANCE WORKS, LIMITED

An undertaking of great magnitude is that which was started by the Coventry Ordnance Works some years ago, and the rapid growth of this Company's establishments during the last six or seven years is a sufficient proof that the undertaking has proved a success.



COVENTRY ORDNANCE WORKS.—Barbette with two 13.5 inch Guns

Before going on to discuss the various establishments of the Firm and its output, we may say that the Company itself is owned by a combination of three large Shipbuilding and Engineering Firms,—Messrs. John Brown & Co., Messrs. Cammell Laird & Company, Ltd., and Messrs. The Fairfield Shipbuilding Company, Ltd.

The Coventry Company works largely in conjunction with these three Firms, who are thus enabled to offer tenders for every kind of war material for naval or military purposes, ranging from the large super Dreadnought battleship built, engineered and armed complete to the smallest type of rifle calibre machine gun.

The designs and productions of the Coventry Company have been uniformly successful in competition with those of other manufacturers and in Service trials, with the result that they have been extensively adopted by the British and other Governments for use in Naval and Military Service. The resources, energy and capability of the Firm are such that during the extraordinarily short time of seven or eight years which has elapsed since the formation of the Company it has been possible for them to erect all the necessary buildings and plant, to design and manufacture the very largest types of guns and mountings for Naval Service, with the result that the Company are to-day considered equal to any other Firm as regards work of this description.

Guns and mountings have been manufactured at the Company's Works from the very largest Naval gun to the very smallest machine guns, and the Works are also equipped for the manufacture of all classes of ammunition, complete in every respect, including fuzes, tubes and primers.

The Coventry Company being exclusively Ordnance manufacturers are able to wholly concentrate their attention upon this branch of engineering, with the result that a very high degree of skill is displayed in meeting the exacting conditions which obtain in the design and construction of modern war material.

The Company possesses four establishments: the main Works at Coventry, the Erecting Works at Scotstoun, near Glasgow, the Ammunition Works at Cliffe on the Thames, and a large Proving Ground near Boston on the Wash. In addition they have Offices in London at 28, Broadway, Westminster.

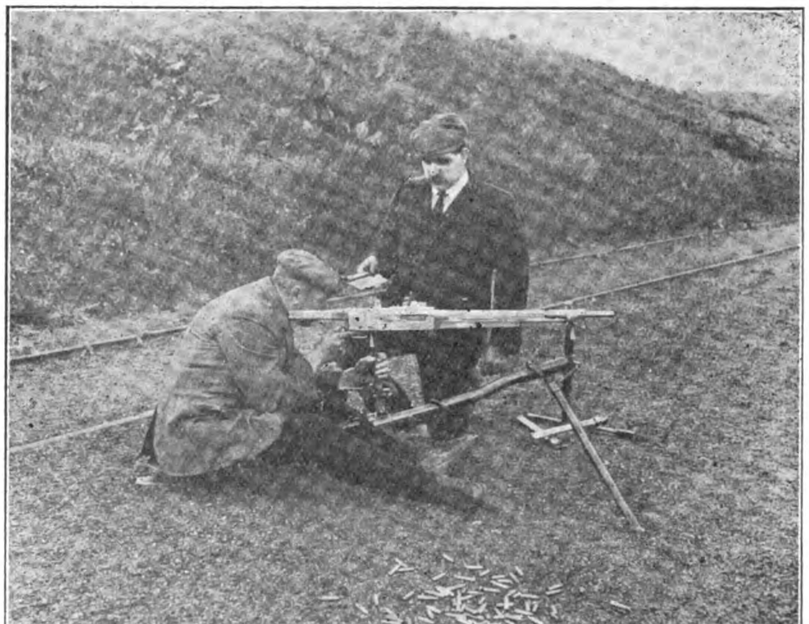
The main Works at Coventry cover an area of about 60 acres and comprise the Head Offices of the Company. Here are manufactured Guns, Carriages, Mountings, Aeroplanes, Machine Guns, Cartridges, Fuzes, Sights etc. The forgings for the guns are received from the parent Companies Steel Works at Sheffield; they are treated and machined at Coventry, and are then built up to the finished guns.

The component parts of Garrison and Barbette Mountings are made at Coventry, and are sent to the Scotstoun Works to be erected and tried in the pits.

Field Equipments, medium calibre Nava guns and mountings, small guns and mountings, carriages, aeroplanes, fuzes, etc., etc., are made and completed at Coventry, and delivered direct from there.

The Scotstoun Works receive the component parts of the larger mountings from Coventry, manufacture the plate and angle portions which are too large for railway transport and complete and erect these mountings for trial.

These Works cover an area of about 16 acres and include a large dock for the transport of Service gun machinery. All tests of gun machinery are carried out in numerous pitsprovided for the purpose prior to its discharge by barge to its destination.



COVENTRY ORDNANCE WORKS.—Laird-Coventry Machine Gun

The Ammunition Works at Cliffe on the Thames cover an area of 10 acres and are employed in the manufacture of propelling and exploding charges for guns and projectiles.

A small gun range is situated at Coventry, used for testing the smaller guns and carriages and for experimental purposes, and a large gun range near Boston on the Wash is under construction. This range will be 12½ miles in length; the whole being level and above low water. It will be used for carrying out proof, ballistic, fuze trials, etc., of a severer nature than can be dealt with at the Coventry range. Projectiles can be recovered for examination.

From the foregoing particulars it will be seen that the Company are fully equipped for the manufacture of the higher classes of Naval and Military Armaments. The Company have been in existence as manufacturers of Armaments since 1905. The rapid growth of the business during this period has necessitated continuous additions to their premises and plant.

As regards the work done in the past by the Coventry Company, it will be sufficient to say that they have manufactured for the British and other Governments war materials of every description, that these manufactures have been tried and proved highly successful, and that a large number of the designs of the most recent guns, mountings, field carriages and equipments, to be found in the British Service, have been drawn up at Coventry in the past.

The earlier work of the Company consisted in the re-armament of British Field Artillery, large quantities of 13 and 18 pounder equipments and of 4.5" Howitzer equipments of Coventry design having been supplied. This work was followed by very large orders for 3", 4" and 6" Naval guns and mountings; many of the most recent designs of this class of ordnance to be found in the British Navy having been drawn up at Coventry.

Within the last 4 years the earlier successes of the Company have been followed by the adoption of a Coventry design for twin hydraulic barbette mountings for 13.5" guns. Mountings of this design have been and still are being manufactured at Coventry and completed at Scotstoun. Contracts for 13.5" and larger guns have been and are being executed by the Company.

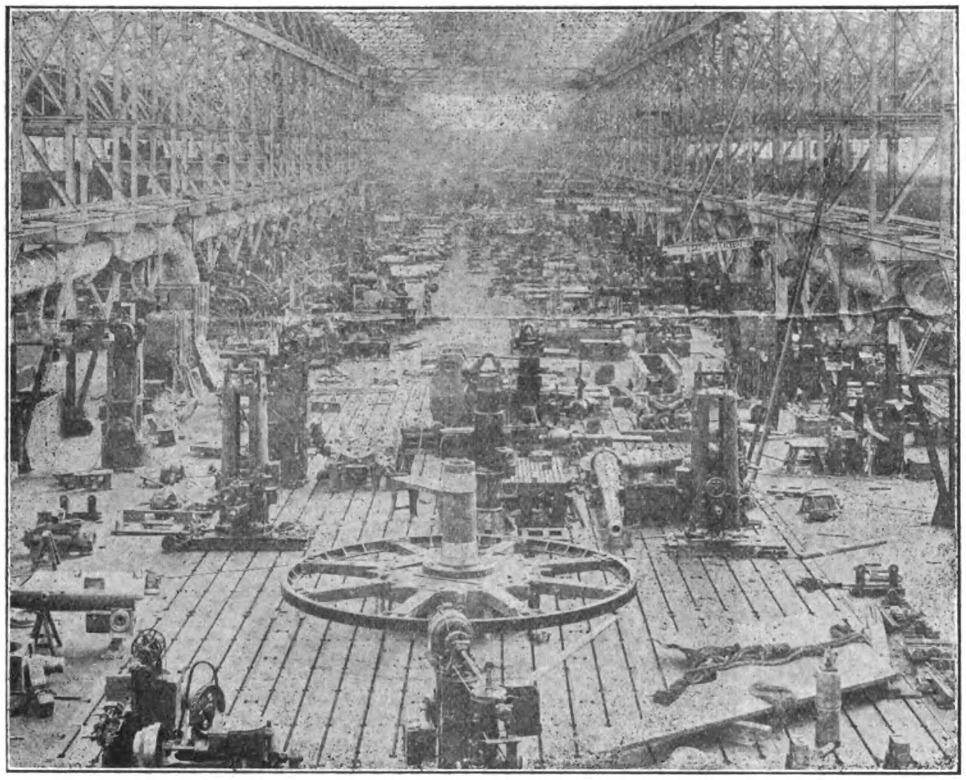
As regards the most recent innovations and extensions of the Company, we cannot do better than quote the references to these made in Earl Brassey's *Naval Annuals* for years 1911, 1912, and 1913. The 1911 edition contains the following paragraphs:

"The Coventry OrdnanceWorks during the last twelve months have been busily employed in the manufacture of ordnance, ranging from the largest calibre of modern guns down to twelve-pounders, and in

naval mountings from the largest size of barbettes to small trans ferable mountings. During the present year five barbette mountings will be delivered and other sets are in course of manufacture. A large number of 6-in., 4-in. of various types,and 12-pr. guns and mountings of new design are under construction.

A Coventry type of 6-in. mounting (Mark VI) on the same lines as that illustrateed in last year's *Naval Annual* has been adopted by the Admiralty, and a large number arebeing made at Coventry. This mounting has several unique features, and is an advance on earlier types. Before being adopted, the mounting was subjected to exhaustive trials at sea. These mountings are provided with cast-steel shields made by Messrs. Cammell Laird & Co.

A new design of mounting for destroyers has been designed by the Coventry firm, and has been adopted by the Admiralty. This mounting (the 4-in. Mark V) takes a low-velocity 4-in. gun, and has several novel features. It is an improvement on that mentioned in the *Naval Annual* for last year."



Coventry Ordnance Works.—Centre Bay of the Naval Shop

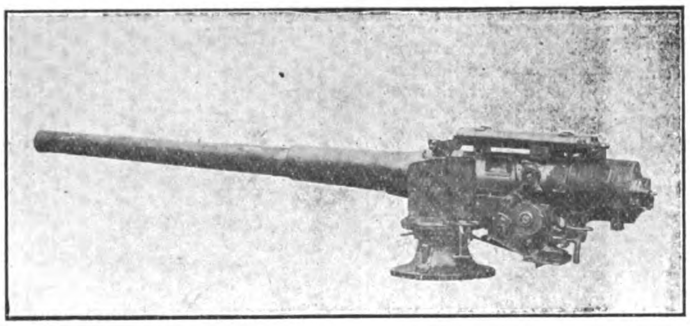
And in 1912 the *Annual* publishes the following:

"The expansion of the Coventry Ordnance Works during the last year has been considerable. In order to deal with the increased volume of work and ensure rapid delivery, large additions have been made to the plant of the Company, new shops fitted completely with machines of the latest types being installed at both the Coventry and Scotstoun Works.

Amongst the many other innovations introduced during the last year the following are of general interest: —Designs of guns for the attack of aeroplanes and balloons are being produced and promise to be very successful. Various models of an entirely new design of automatic rifle are being manufactured at the Works. These models can be arranged to be functioned by gas, or recoil, and are being adapted for different sizes and classes of ammunition. An experimental automatic rifle calibre machine-gun has been manufactured and passed through successful trials. The mechanism is similar to that of the automatic rifle, and the designs allow great advantage in weight over existing types, and also have the advantage that when supplied in conjunction with the rifle no special training of the troops is required for the use or care and maintenance of the machine-gun.

Extended and most satisfactory experiments with fuzes for high explosive shell have been carried out, and the fuze design shows several novel features, especially as regards safety arrangements.

Amongst the improvements introduced into hydraulically worked mountings is a hydraulic sight. The arrangement is such that the power required to raise or lower the sight is supplied by a hydraulic cylinder, the movement of which is controlled by a rotating valve operated by the range dial spindle. The range is revolved by hand in the usual manner. A feature of this arrangement is that the dial can be placed behind the sight where there is ample space in the turret. Also all mechanical gearing, and consequent backlash, is obviated. The optical part of the sight can be passed either vertically or horizontally through the gun-house armour. Owing to the small power required to turn the range dial, this sight readily lends itself to any method of director-control from a central position.



Coventry Ordnance Works.—Six inch Gun and Mounting

Another novel feature in connection with hydraulic mountings is an improved ramming and cordite tilting, by means of which the total time previously required to load any given type of gun is materially reduced.

The 6-in., 4-in. high and low velocity and 12-pdr. designs of mountings have been improved and brought up to date in the light of recent experience.

As regards the num ber of contracts now in the hands of the Coventry Company rapid strides have been made during the last few years. Guns ofvarious sizes, including the very largest manu factured, have passed successfully through proof, and several contracts for guns up to the largest sizes are now being executed for the British and other Governments. The five twin 13.5" hydraulic mountings for the Conqueror have all been tried with marked success in the pits at the Scotstoun Works of the Firm, and the gunnery trials of these mountings at sea will probably have been carried out before this volume is in print. The manufacture of the five similar mountings for the Ajax (the order for which was placed during the latter part of 1910) is nearing completion. A further order for a set of five heavy mountings for a battleship of the 1911-12 programme has re-recently been received. A new Coventry design Mark VII. of a 6-in. upper deck shielded mounting has recently been acceptedby the Admiralty, and an orderfor a number of these mountings is in hand. Several contracts for varioussizes of the Coventry-Holmstrom breech mechanism have also been made.

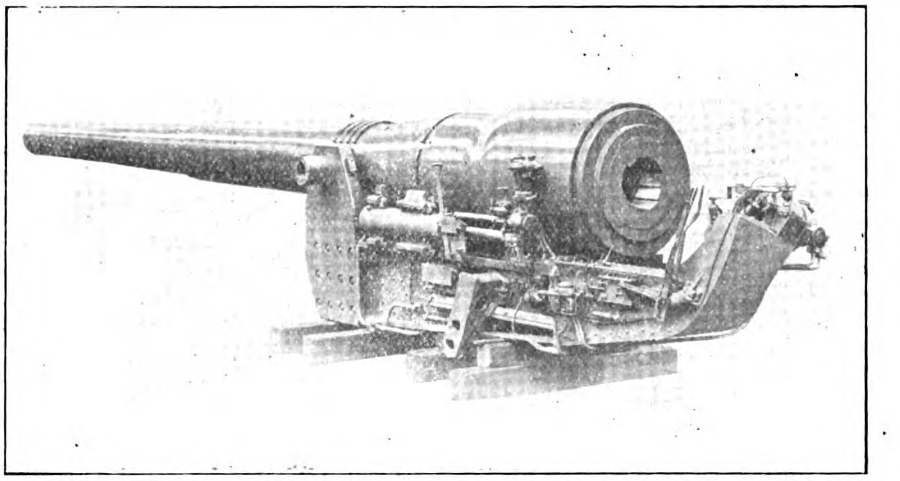
. . . .

The 1913 *Annual* contains several references to Coventry Ordnance Works, amongst them being the following:—

"The gun-mountings for the Conqueror, which were designed and manufactured by the CoventryOrdnance Works, Limited, have now satisfactorily completed their trials. These mountings embody several novel features, particularly as regards the recoil arrangements. These latter, being of a new and improved design, required certain adjustments, which caused some delay in the handing over of the ship. The gun-mountings for the Ajax and Benbow beto a design of the Coventry Ordnance Works, Limited, are now ing completed by that firm. Orders have been received by this Company during the year for Holmstrom breech mechanisms, which are now being manufactured in all calibres up to 14 in. The reports received from the ships in which this mechanism is fitted are pf the most gratifying nature, and it seems orobable that its adoption on a large scale by various Governments in the near future is assured.

. . . .

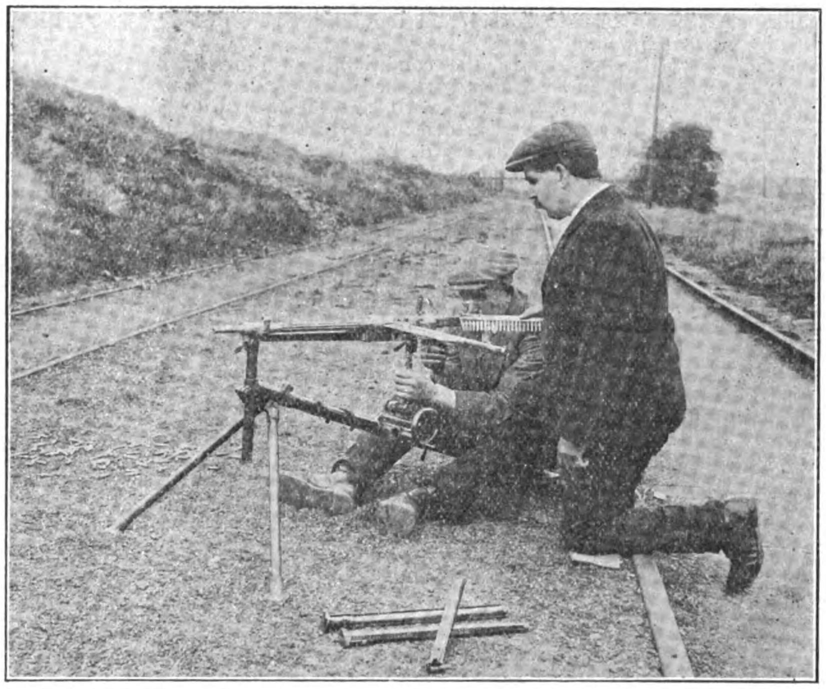
"The Coventry Company have also during the past year developed designs of guns and mountings specially for use against air-craft and also a gun for mounting in air-craft. The special features of the anti-aeroplane gun are a sight which is intended to allow for the speed of the aeroplane, and a predicting device which will make the setting of the shrap nel fuse, hitherto considered an almost insuperable



COVENTRY ORDNANCE WORKS.—13.5 inch Gun on Slide

difficulty for this class of work, a matter of the greatest precision. The exact setting of the sight for range, elevation and speed of target is controlled automatically by the range-finder.

The same firm have been working for the past year on a machine-gun of rifle calibre, and hope in a short time to be in a position to put forward a weapon capable of meeting all the requirements which this type of ordnance has now to fulfil. The demand for a machine-gun for mounting on aeroplanes has shown that the usual beltfeed gun has considerable disadvantages when so used, and that a gun provided with a simpler system of feed, such as magazines or chargers, and capable of being easily handled by one man, is more suitable. The Coventry gun is suited for this class of work, and the weight of the gun is a recommendation in its favour."



COVENTRY ORDNANCE WORKS.—Laird-Coventry Machine Gun

Since the publication of the *Annuals* above referred to the armament of H.M.S. Ajax has undergone its trials in a most satisfactory manner and passed into the service, considerable orders for Coventry machine-guns have been received, also other important orders, including order for the armament of one of 1913-14 British Dreadnoughts, orders from the British Government for Aeroplanes, etc., etc.

Orders for war materials have also been received at different times from the Chilian, Japanese, Russian, Swedish, American, Canadian Governments, etc.

A Small-Tool Department at Coventry supplies twist drills, milling cutters, specially hardened screw gauges, etc., for the Works and for commercial purposes.

The Coventry Ordnance Works are represented in the Far East by Messrs. Samuel & Co., Ltd.

THE PEKING SYNDICATE

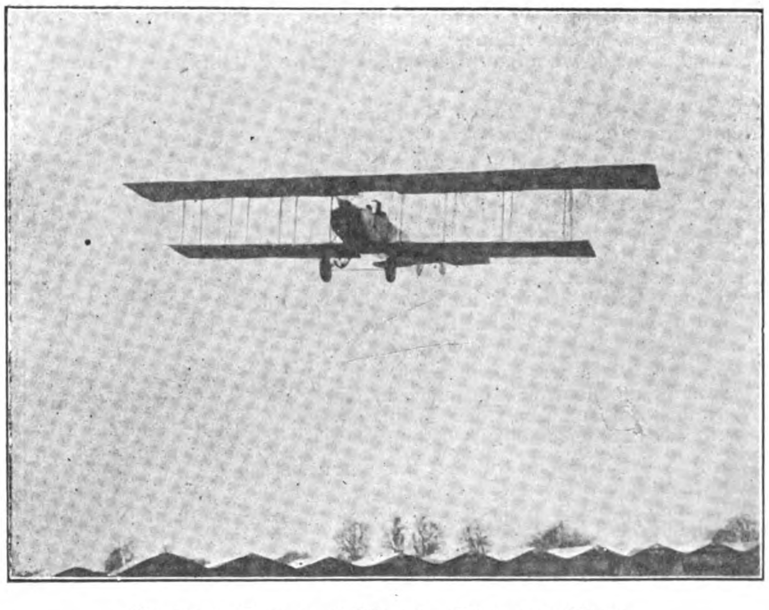
In conformity with the wish expressed by shareholders at the general meeting last December, a circular has been issued by the Peking Syndicate giving information regarding the company's operations before the annual meeting.

It states that in October last Mr. Benque, a mining engineer, was engaged to report upon the company's works in Honan, and that his report, dated January, 1913, confirms the favourable statements previously given to the shareholders regarding the quality of the coal and the prospects of the colliery. The recent decrease in the output, recorded in the monthly statements, was caused by the flooding of two of the most productive pits, Nos. 2 and 4. Steps have been taken to increase the output of No. 6 Pit to 600 tons per day, whilst a scheme was approved in April last by the directors whereby coal can be worked in the native way, cheaply and without new plant, by small pits which it is hoped will yield up to 1,000 tons per day in due course. Several of these pits are already being sunk. Further, in May last the directors approved of another proposal for putting down a pair of modern shafts near No. 24 Borehole, where good coal is proved to exist at a depth of 300ft. This plant will be electrically worked from the present power plant, and is estimated to produce 1,000 tons per day. The first shaft on July 2 was already 120ft. deep, and coal was expected to be reached about the middle of August.

As far as practicable, without sacrificing the interests of the shareholders, it has been the directors' policy not to involve the company in any increase of either capital or working expenditure, but in order to meet the consequences of the accidents mentioned the directors have approved of this new development work.

Steps are now being taken to extend the company's activities under the rights conferred by the Honan Concession of June, 1898. In this connection the Syndicate has assisted in the promotion of the Banque Industrielle de Chine. The directors announce that the Agent General, Mr. J. R. Brazier, is compelled to sever his connection with the company and return to Europe for family reasons. The appointment has been given to Mr. J. P. Kenrick, who has occupied the position of Engineer-in-Chief at the collieries for six years.

THE stimulation of plant growth by means of electrical currents has now, says the *Scientific American*, been carried on over a period of 167 years, and to this day it is hard to point to any tangible and generally applicable results of these investigations, nor has this mode of cultivation yet entered into the calculations of the ordinary agriculturist for horticulturist. In a voluminous work on electroculture recently published by Dr. A. Bruttini, of Rome, it is stated that 187 persons are known to have carried on experiments in this field. Of these, 133 reported favourable results, 21 were doubtful, while 33 found the application of electricity to plants to be distinctly unfavourable. A majority of the first group employed more or less unscientific methods. Nevertheless electroculture continues to be the cherished dream of many present-day experimenters, as is witnessed by the fact that an "International Congress of Electroculture" was held at Rheims last autumn.



COVENTRY ORDNANCE WORKS.—Biplane in Flight

CORRESPONDENCE

(The views expressed by correspondents are not necessarily endorsed by the FAR EASTERN REVIEW).

THE PEKING LEGATION MACHINERY

To the Editor of the
"FAR EASTERN REVIEW"

SIR,

In order to remove a serious misapprehension which is damaging British engineering interests in China, the British Engineers' Association has obtained the authorization of H. M. Office of Works to publish a letter addressed by that Department to this Association, dated March 7th, 1913, and a schedule containing the names of certain contractors which accompanied it. Copies of these are attached to this letter.

These documents have to do with a contract for an electrical and refrigerating installation recently erected at the British Legation in Peking.

The conditions surrounding the invitations to tender and the placing of this contract have led to very general belief that the machinery was manufactured in Germany.

The false impression to the effect that the official centre of British interests in China had been equipped with German machinery has proved a severe blow to British engineering prestige. The Chinese are continually told, by the representatives of certain continental firms, that the British Government were obliged to go to Germany because there were no makers in England capable of doing the work satisfactorily.

The enclosed documents show that there is no foundation whatever for this statement.

This Association would therefore deem it a favour if you would give publicity to the letter from the Office of Works above referred to, and to the following facts:—

(1) The contract was not given to the Siemens China Electrical Engineering Company, a purely German concern representing the Siemens Germen interests, but was placed with the Siemens Bros. Dynamo Works, Limited, in London. Whether this firm is considered British or not, it possesses works in Great Britain.

(2) Messrs. Siemens only manufactured a portion of the plant in question, and this, according to the enclosed letter, was manufactured not in Germany, but in England.

(3) The rest of the plant was also manufactured in Great Britain by the British firms whose names are given in the schedule attached, some of whom are members of this Association.

The following causes gave colour to the misconception that the machines were German:—

(*a.*) Until now no official denial has been published.

(*b.*) The erection of the plant at the Peking Legation was entrusted to a German firm in China, the Siemens China Co., and this Co. were assumed by many to be the contractors owing to a similarity between their name and that of the contractors.

(*c.*) The public generally have either been unaware that there was a stipulation that the whole of the plant must be made in Great Britain, or have believed that such a stipulation was not enforced.

This Association is aware that the manner in which this contract was negotiated and placed, has caused grave dissatisfaction among the purely British firms who originally tendered. On this question, however, I am not directed to enter. The point which this Association is anxious to make clear is that, on the authority of H. M. Office of Works, the whole of the plant installed at the British Legation in Peking, was manufactured in Great Britain.

I am, Sir,
Your obedient servant,
STAFFORD RANSOME,
Secretary of the British Engineers' Association.
Caxton House, Westminster,
London S.W.

Letter from His Majesty's Office of Works, dated 7th March, 1913, to the British Engineers' Association.

SIR,

With reference to your letters of the 12th instant and 22nd ultimo, I am directed to furnish the following information respecting the Contract for Engineering Works at the British Legation at Peking.

1.—Tenders were originally invited in August, 1911, from British firms only, and before an invitation was issued to the firms whose tender was ultimately accepted they were required to satisfy both the Board's officer in Peking and the British Consul that they might be so regarded.

2.—Owing to the condition prevailing in China in December, 1911, the Board decided not to proceed with the work, and the firms who tendered were informed accordingly. No undertaking was given, however, that fresh tenders would be called for at a subsequent date.

3.—When it was found possible to proceed with the work time did not permit of the invitation of fresh tenders, but the two firms who had submitted the lowest tenders in the first instance were asked to submit fresh prices. The more favourable tender, that of Messrs. Siemens Brothers Dynamo Works, Limited, was then accepted.

4.—The whole of the plant has been manufactured in England. A Schedule is attached showing the names of the sub-contractors by whom the various parts of the work have been undertaken,

5.—The erection of the plant is being carried out by the contractor's representatives, the Siemens China Electrical Engineering Company, under the supervision of a British engineer, by whom Chinese labour is being employed direct.

I am, Sir,
Your obedient servant,
(Signed) LIONEL EARLE.

The Secretary,
British Engineers' Association,
Caxton House,
Westminster, S.W.

British Legation, Peking

Main Contractors for the above contract—Siemens Brothers Dynamo Works, Limited.

The following is a list of the contractors and the material they are supplying:—

SPECIFICATION A.

This covers:—

1.—Steam Heating installation.

2.—Hot and Cold water supply installation.

1. Steam Heating.

Contractor.	*Material.*
Messrs. Babcock and Wilcox.	Main Boilers and fittings, Weir's feed pump, pipework in boiler, house and engine rooms.
„ Atmospheric Steam Heating Company..	Complete steam heating installation in the various buildings, including pipework, feed-water heater, vacuum pumps, radiators, valves, fittings and accessories.

2. Hot and Cold water installation.

Contractor.	*Material.*
Messrs. Rees Roturbo Mfg. Co.	1,000 gallon pumps.
„ Siemens Brothers Dynamo Works, Ltd.	Motors for above pumps.
„ Whipp and Bourne.	Starting gear for above Motors.
„ Fredk. Braby and Co.	Tanks, Cisterns and Cylinders.
„ Hartley Sugden, Ltd.	Dome top boilers.
„ Stewarts and Lloyds.	Valves and lap welded tubes and accessories.
„ T. and W. Farmiloe, Limited.	Lead piping, paint, etc.
„ Merryweather and Sons Limited.	Fire Hydrants.
„ Thos. Piggott and Co., Limited.	12 × 12 × 8 ft. pressed steel tank.

SPECIFICATION B.

This covers:—

1.—The Electrical Generating Plant.

2.—Ice-making Plant.

1. Electrical Generating Plant.

Contractor.	*Material.*
Messrs. Siemens Bros. Dynamo Works, Limited.	Main generators, main switchboard, main cables, motor booster set, wiring material for engine and boiler rooms, electrical fittings and accessories.
„ Belliss and Morcom, Ltd.	Main Engines.
„ Pritchett and Gold.	Battery.

2. Ice-making Plant.

Contractor.	*Material.*
Messrs Siemens Bros. Dynamo Works, Limited.	Motor for driving ice-making plant.
Mr. Sam. Puplett.	Ice-making Plant.

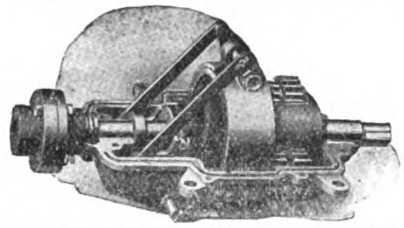
VLADIVOSTOK TRAMS

Commenting on the tram service of Vladivostok a correspondent of a Tokyo paper writes "Vladivostok now has several fairly well-paved streets and a tramway—the first of the kind in Siberia. Japan might take a valuable hint or two from the manner in which Vladivostok manages its system. Of course the cars are small, since the traffic cannot be mentioned in the same breath with that of a city like Tokyo or Osaka; but in all that relates to cleanliness and comfort the Vladivostok trams are far superior to the Japanese. To begin with, every car is divided into first and second class, the minimum fare for each being eight and five kopeks respectively. The fare, however, varies according to distance, the highest first class fare being twenty kopeks, which will take the traveller over the entire system. There are two conductors on every car, one for the first and the other for the second-class division. Tokyo might also imitate the sanitary wooden seats adopted in these cars in preference to retaining those red-plush abominations which amass untold quantities of dust and bacteria. Here, too, tickets are not collected when the passengers alight nor are they clipped. The method of what in Russia is almost reverentially styled "control" appears to be very elaborate, for there are almost as many inspectors as there are cars. The single trolley line is in use, and the exasperating delays which are continually occurring in Tokyo to permit the conductor to restore the detached trolley poles to the double wires overhead are unknown here."

MOTOR BOATS AND THEIR EQUIPMENT

The Baldridge Reverse Gear

We understand that for the 1913 season the Baldridge Gear Co. have placed on the market five new models, suitable for engines $4\frac{1}{2}$ h.p. to 12 h.p., 7 h.p. to 20 h.p., 10 h.p. to 30 h.p., 15 h.p. to 45 h.p. and 25 h.p. to 60 h.p. In these new models numerous improvements will be found. In general design the Baldridge is of the balanced planetary type, a special feature being that the cage, which contains the train of gears acts as the driving instead of the driven member. The cage is fitted with a two-step gear on each side, and couples to the crankshaft of the motor by a flange. The double gear construction insures good balance, eliminating side strain or vibration. Another characteristic is that instead of driving



through a broken shaft, the propeller shaft extends in unbroken section from the supporting propeller and bearing to the forward.

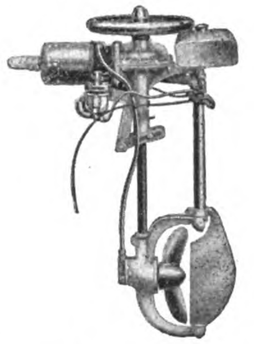
The essential of a reversing gear being a powerful clutch, the improved type of internal or ahead clutch used in this design will be found to be capable of carrying large overloads beyond its rated capacity. It is fitted with double expansion members providing uniform expansion and contact against all parts of the drum. The reversing clutch band, made of alloy steel, has double cam levers, accomplishing equal expansion and contraction of this clutch, so that, when the ahead clutch is in engagement the reverse clutch is free and separated not only from the drum, but also from the housing and frame, obviating change for binding, friction or contortion.

The gearing is entirely enclosed in iron or aluminum casing, and there are no moving parts outside except the control lever, preventing possibility of leakage, throwing of oil and grease, or injury to the operator. The operation is by a single control lever. A new feature is the construction of the control lever in two parts, the upper portion being tubular, fitted into a socket in the lower portion. In emergencies, by a single movement of the lever it is possible to shift from full speed ahead to complete reverse without damage. Lubrication by the splash system is positive, and requires attention only at long intervals. The lower section of the casing is kept about half full of lubricant, which is automatically distributed to all parts by the revolving internal mechanism. The makers are The Baldridge Gear Company of New York. Catalogs and further particulars may be obtained on request.

The Waterman Outboard Motor

Some owners of small sailing craft and dinghies raise objections to auxiliary motor power on the grounds that valuable accommodation is occupied by the machinery. This drawback is easily evercome by installing, or rather fitting a device such as the Waterman Outboard Motor on the stern of the boat. There are quite a number of such devices, and one of the first made was the one in question. We have been advised by the Waterman Co. that although they have been manufacturing this set since 1906, and have introduced many new models since then, they have never before made so many changes and improvements in the design as when bringing out this season's equipment. A few details of the construction may be of interest.

The motor is of the conventional two stroke type with the erankcase volume reduced to a minimum, giving a high base compression and consequently a good range of speed control under throttle. This, taken with careful design of port area in relation to piston displacement, gives the greatest possible power for the bore and stroke, and also a high efficiency and economy of fuel, which is aided by the length of the stroke—3″—in proportion to the bore—$2\frac{3}{4}$″—for it has been found that economy and efficiency cannot easily be secured in relation to power with a relatively short stroke engine. The power developed by this engine is 3 B.H.P.



In the new model is fitted a water jacket of spun copper attached to the cylinder by a method which they originated some years ago in their high-speed lightweight engines of the ordinary marine type of from 8 H.P. to 24 H.P. The fly wheel is counter weighted and its rim is finished as a hand wheel with which the engine may be started in either direction.

To prevent damage from knocks and also to save the operator from contact with its electrode, the sparking plug is provided with a protecting cap. This protector, as well as the crank case, clamps, thrust links, exhaust pipe, rudder yoke, rudder, and gearcase, are of copper alloy aluminum for salt water use. This alloy has now been tested by the manufacturers for eight years and has, they claim, proved to be unaffected by the action of salt water.

Bevel gears are arranged in the gearcase and are run in non-fluid oil, one filling being usually sufficient for a season's uses. A bronze gear pump is fitted into the end of the gearcase, and carries cooling water from the inlet through a copper tube to the water jacket, from the overflow of which it passes into the exhaust pipe.

The rudder is swung on a skeg, which is cast integral with the gearcase, and protects the propeller in case it projects below the boat's keel. Steering is by means of a rudder yoke and metal cored tiller line. The ball bearing with its hardened and ground steel collars and balls are carried in a bronze retainer. This bearing is literally bathed in oil at all times, and takes the entire weight of the fly wheel, crank shaft, shaft coupling, driving shaft and driving gear. Another feature is the location of the supporting clamps. They are swivelled on the engine cylinder at a point near the center of gravity of the engine and take the driving thrust through the adjustable links from the upper portion of the drive tube, thus taking all thrust or driving strain away from the crankcase.

The carburetor is of the usual float-feed type with a "floating ball" automatic air adjustment made especially for this engine by the Byrne-Kingston Co. Ignition is by battery and trembler coil neatly boxed and wired in the standard equipment, but a Boech magneto is furnished when desired. The makers are The Waterman Marine Motor Co., No. 47 Broadway, New York. Catalogs and further particulars may be obtained upon request.

Morss Motor Boat Equipments

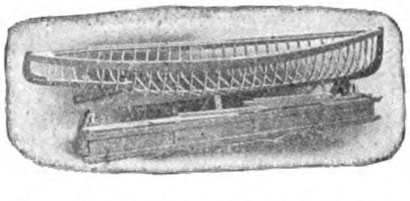
The A. S. Morss Company of Boston is one of the leading marine supply houses in the United States of America. The Company's extensive line includes fittinge of every conceivable sort for boats of every kind and size, as well as tools and supplies used in building boats.

A well-constructed and successful boat must be built from a good design, of good materials and by a skilful builder, and must be fitted with suitable appurtenances. This means that the hardware and fittings must be designed for marine use. Ordinary house hardware will not give satisfaction. The matter of fittings is really of more importance than most people imagine, as the durability of the boat, as well as the general style depends so much upon them. The Morss Company has been in business for over 68 years, so naturally it knows the requirements of boat owners and boat-builders.

In addition to the stock line of articles, this Company maintains a mechanical department for manufacturing special steering gears, fits up propellers with shafting, makes special forgings, castings, and tanks of all descriptions. This feature is very valuable to the boat owner, who, in many cases, is unable to find exactly the fitting he requires in stock.

The Morss marine hardware catalog is a 600-page pocket-size book, is fully illustrated and is a veritable compendium of information about boat fittings. This enables a person in any part of the world to select an order of goods with the certainty of getting exactly what he wants, and Morss customers may be found in all quarters of the globe. A request for quotations is welcomed by this Company and its prices will be found to be right.

Address inquiries to the A. S. Morss Co., No. 47 Broadway, New York City, New York, U.S.A.



The Niagara Motor Boat Company

The Niagara Motor Boat Company are the originators of the famous "Niagara" system of building boats from finished but not assembled material.

The "Niagara" knocked-down sets include every item necessary to complete the hull with clean and simple instructions for the assembly.

One very salient feature of Niagara frames is the fact that each frame is first carefully set up and each part fitted, making the reassembling of it a very simple matter.

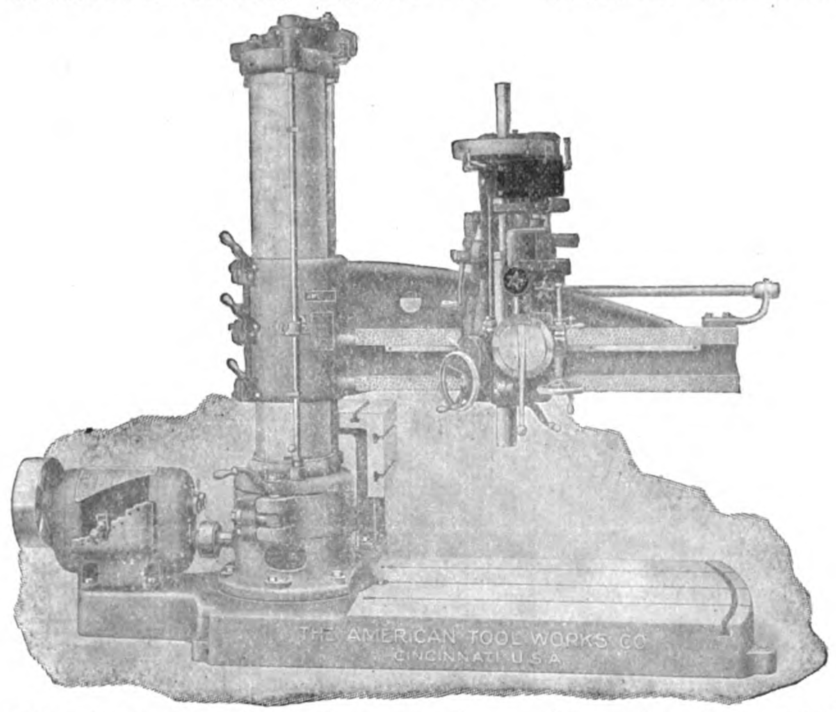
Boats built from these frames will be found to be of excellent design and thoroughly up-to-date owing to the fact that new designs are gotten out each year. The Niagara Motor Boat Company has published a handsome 48-page book showing the advance designs for the season of 1913. A copy will be mailed to any one interested upon request.

The makers are The Niagara Motor Boat Company, No. 47 Broadway, New York City, New York, U.S.A.

A considerable proportion of the small mild steel castings used in automobile construction are now, according to the *Ironmonger*, being produced in the electric furnace. Many of these parts come from Switzerland, but they are also being made in several places in England. One of the largest automobile firms has recently installed an electric furnace at its works for the purpose of supplying its own castings. Several furnaces of this kind have been at work commercially in Sheffield for some considerable time, and others are in the experimental stage, but in view of the competition which is growing outside that centre a development of electric melting may be expected there in the near future. The demand for automobile castings has attained large proportions, and has increased so rapidly and continuously that, in spite of the additional makers who have come into the field, there is no difficulty in obtaining as many orders as can be executed.

"AMERICAN" TRIPLE GEARED RADIAL DRILL

The accompanying illustration shows an "American" Triple Geared Radial Drill, equipped with power tap leading mechanism, making it possible to lead taps by power. The purpose of this mechanism is to feed the spindle at the same rate of advance per revolution as the pitch or lead of the tap being used. This

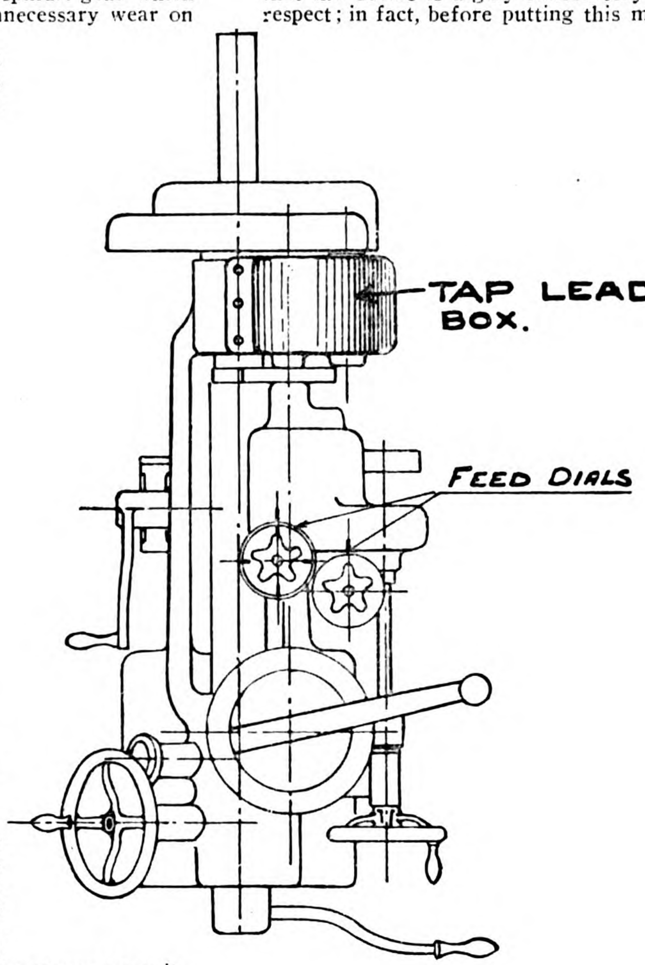


feature is of great value, as it prevents the reaming or crossing of the threads, also the distortion due to the weight of the tap, the effort required to feed itself and to pull the spindle after it, while tapping, also prevents unequal wear on the tap, consequently insures much longer life.

The tap leading mechanism is a separate inclosed unit, mounted upon the head, directly above the regular feed box, and is connected to the box by means of a shaft which carries the operating rod and drive key for connecting the various feeds and leads.

There is absolutely no interference between the feeds and leads, as the mechanism is arranged to automatically engage one while the other is in use. When not in use the lead mechanism can be disengaged from the spindle gear which drives it, thus preventing unnecessary wear on the gears, etc.

The large dial on which the leads are indicated is divided into two circles: the regular feeds being shown on inner circle, the leads on the outer circle. All that is necessary to do in order to obtain any desired lead is to turn the dial until the lead shown thereon comes opposite the fixed pointer.



Four rates of lead are regularly supplied as follows:

8-10-11½ and 12 per inch.

This range may be varied within certain limits.

The above company has supplied quite a number of their Radial Drills with this mechanism, and inquiries made by them with reference to the operation of the same, prove that the device is highly satisfactory in every respect; in fact, before putting this mechanism on the market, it was given a very thorough test under the most severe conditions. The result not only equalled but even exceeded their expectations.

MINING IN THE FEDERATED MALAY STATES

(*Continued from page 144*)

them from the mines. The Chinese find that they can, as a rule, earn more in the mines than on the estates, and consequently only a few, who are required for such heavy work as felling, clearing, and trenching jungle land, are to be found in the rubber districts. These few are usually working on the contract system under a Chinese contractor and receive about the same pay as mine coolies.

It may be mentioned that wages in Chinese owned and managed mines are often 10 to 15 per cent less than in European mines. To some extent this may be due to a natural preference of the Chinese coolies for working under superintendents and managers of their own race; but it is generally said that many Chinese mine owners hold their coolies by a debt bond, arising from loans and advances, which the coolie find it almost impossible to discharge, and must remain, even when higher wages are offered him elsewhere. The conditions in the Chinese mines are undoubtedly better to-day than formerly, owing to the efforts of the Protector of Chinese, an officer under the Federal Government, but owing to illiteracy and ignorance among the coolies these abuses can not be entirely prevented.

TRIBUTE SYSTEM

The foregoing figures show that 55 per cent of all the labor in the tin mines in 1910 was working under "tribute," and it is estimated that 65 to 70 per cent of all ore recovered is won by this method of labor. Tribute is the local term for "working on shares." The holder of a mining lease often avoids the risk incident to working his property by allowing individuals, or a Chinese employer of labor, to work the mine upon payment of a fixed percentage of the ore recovered. The percentage depends, of course, upon the richness of the deposit and the ease or difficulty of raising and treating the karang. In almost every mine the dumps and tailings are worked over by tributers, who pay 10 to 15 per cent of their profit for the privilege. The popularity of tribute working with the Chinese lies in the fact that, though it may not pay so well in the long run as a fixed wage, there is always the possibility of striking it rich. Tbe principal objection to tribute working is that antiquated methods are usually employed and the lower grades of karang disregarded. It is obvious that a tribute worker whose very success may lead to a cancellation of his privilege or to the exaction of an unreasonable tribute is not likely to install modern machinery or treat low grades of tin-bearing earth in a property belonging to another. Therefore it may be said that the decrease of 14,000 in the number of tribute laborers in 1910 as compared with 1909 is an indication of the adoption by mine owners of improved methods and more machinery, an indication which is supported by the fact that the total horsepower (steam, gas, and hydraulic) employed in the tin mines in 1910 was about 10 per cent greater than in the preceding year, reaching a total of 18,515 horsepower.

TAMIL AND OTHER LABOR

Over 75 per cent of the hands now employed in the tin mines are Chinese, the remainder being principally Tamils, with some Malays, Javanese, and Punjabees. The Malays are usually employed only as mill hands and machinists, and the Punjabees as watchmen. On the rubber estates many of the Javanese laborers are identured for a fixed term, but those employed in the mines are all free labor.

The amount of Tamil labor in the tin mines is steadily increasing, as it serves to supply a deficiency in Chinese labor and thus prevents a demand for any considerable increase in wages. These Tamils are recruited from the Madras Presidency of India, either by the miner's own representative (holding a Government license) or by the representatives of the Immigration Committee, a body appointed by the high commissioner of the Federated States The Tamil immigration fund enactment provides that to meet the expenses of recruiting, to provide free transportation of the Tamils and their families to the Federated Malay States, and to maintain a home for decrepit Tamil laborers, every employer of Tamil labor in the Federated Malay States shall be assessed once in three months an amount not exceeding $1.70 United States currency per quarter for each Tamil laborer in his employ. Furthermore, the act provides that if the returns which the employer is required to make show that the number of Tamil laborers in his employ is greater than the number for which he has provided free passage from India in the two preceding years, a further assessment may be levied for each laborer in excess; the total assessment, however, may not exceed $1.70 per quarter for each Tamil employed. For the last two quarters of 1911 the rate levied was $1.135 under the first section of the act, and a further charge of $0.565 under the second clause.

Coal Deposits

In conclusion, mention should be made of the fact that coal deposits have recently been found near Rawang, in the State of Selangor, which it is hoped will prove of value. The specimens obtained from the trial workings are a low grade of hydrous lignite, but the quality may improve at greater depths. The Rawang Federated Malay States Coal Syndicate (Ltd.), with a capital of £25,000, has been registered in London to develop this field, though it is understood that the Government of the Federated Malay States will retain a controlling interest.

BLACK SANDS OF PARACALE

BY P. R. FANNING AND F. T. EDDINGFIELD

The Philippines division of mines, Bureau of Science, has been carrying on experiments to determine the economic possibilities of black sand and especially the black-sand concentrates caught on the tables of a dredge. A brief outline of the results obtained with the Paracale black-sand concentrates is given in the following article.

The Paracale black sands are made up of the heavy minerals from the rocks and veins in the formation formerly surrounding the placer deposit. These rocks and veins were decomposed and eroded and the heavy particles were concentrated in the alluvials of the Paracale River.

BLACK-SAND CONCENTRATES

Black-sand concentrates are caught on the tables of the dredge and contain the following minerals: magnetite, ilmenite, pyrite, zircon, limonite, pyroxene, olivine, quartz, gold, copper, metallic iron (partly from the dredge), and galena.

The gold occurs: (1) As nuggets, usually sharp and crystaline, free from other minerals, (2) as crystals bound up with quartz, (3) as crystals with magnetite, (4) as very fine gold free in the sand, (5) as very fine gold in quartz grains, (6) as very fine gold bound up in pyrite.

The dredge treatment of these concentrates recovers the majority of the nuggets and the coarse gold bound up with quartz, but only a small percentage of the very fine gold and practically none of the fine gold included in quartz and pyrite.

It was to ascertain the amount of gold lost and the best method of treatment that these experiments were carried on. A preliminary concentration test was made by panning-table concentrates crushed to pass 40-mesh. The concentrates obtained from panning were separated into magnetic and non-magnetic products. The gold panned out was assayed separately.

Panning, magnetic separation test of table concentrates. a

[Values in Philippine currency.]

	Weight.	Composition.b			Assay.	Value distributed in 1 ton of original.
		Pyrite.	Iron.	Non-metallic.		
	Grams.	*Per cent.*	*Per cent.*	*Per cent.*	*Pesos.*	*Pesos.*
Tails	10.76	20	10	70	16.82	1.80
Non-magnetic concentrates ..	33.40	50	40	10	128.36	42.88
Magnetic	52.41	3	97	....	2.40	1.26
Gold	....	....	....	....	....	63.40
Loss in slime	3.43	....	....	....	....	101.92

a Original sample assayed 211.26 pesos. b Estimated by the eye.

A second sample of 200 grams treated in the same manner with extreme care gave:

[Values in Philippine currency.]

	Weight.	Assay.	Value distributed in 1 ton of original.
	Grams.	*Pesos.*	*Pesos.*
Non-magnetic..	91.4	102.80	51.00
Magnetic iron ..	107.5	13.20	7.08
Gold	....	....	91.78
Loss	1.1	....	61.40

Some of the free gold is coated with iron rust and consequently is difficult to amalgamate; the crushing also liberated more free gold than an original sample would contain; this is shown in the following amalgamation test on the original sample:—

Amalgamation test on original table concentrates.

[Values in Philippine currency.]

Weight of sample.	Assayed original.	Tails.	Gold recovered.	Gold recovered.
Grams.	*Pesos.*	*Pesos.*	*Pesos.*	*Per cent.*
1,033.4	211.26	127.26	84.00	39.7

The amount recovered by panning the crushed sample was 43.4 per cent. and the amount recovered by amalgamation of the original 39.7 per cent. It can not be expected that the dredge could save more than either of these tests and it is probable that it can not save nearly as much.

This sample was supposed to be a representative sample from the dredge, and if this were the case it is apparent that the dredge loses more than 50 per cent. of the gold in the ground. This figure has been confirmed by sampling the dredge tailings, concentrating and assaying them, and estimating the total amount of this class of sand wasted and comparing the result with the output of the dredge.

This does not mean that the dredge loses 50 per cent. of the value of the ground as estimated by drive-pipe tests, for such is probably not the case. The drive-pipe tests themselves show only 50 per cent. or less of the gold actually in the ground for such tests and are analogous to the panning concentration tests given above, where less than 50 per cent. of the gold content is saved as free gold.

METHODS OF TREATMENT OF TABLE CONCENTRATES

Sample No. 1 represents the black sand caught in the tables and riffles of the dredge, and thrown aside after panning out the free gold in the regular cleanup. Sample No. 2 represents the concentrates in which mercury had been used by the dredge during its cleanup. The following tests were made:

Magnetic separation.—The majority of the gold in the sample occurs free (due to improper panning in the dredge cleanup) or in association with the non-magnetic material. Hence magnetic treatment will remove a great bulk of low grade tailings and leave a high grade shipping product. This is shown in the following test:

Magnetic separation test on sample No. 2.

[Values in Philippine currency.]

Products.	Weight.	Weight.	Value per ton.	Gold.
	Grams.	*Per cent.*	*Pesos.*	*Per cent.*
Original ..	3,595	100	100.00	100
Non-magnetic	2,100	58.3	170.40	97.21
Magnetic ..	1,495	41.7	7.50	2.79

As indicated by this test, 100 tons of concentrates worth 112 pesos per ton can be separated to give 58.3 tons worth 170.40 pesos per ton and containing 97.21 per cent. of the gold.

Conclusion.—A rich shipping product is easily obtained by magnetic separation of the original product.

Amalgamation tests.—Amalgamation was tried with the original and also after grinding the original through various meshes. A few of the tests are given in the following table:

Amalgamation tests on sample No. 1

[Values in Philippine currency]

Products.	Heads, value per ton.	Tails, value per ton.	Gold saved, per ton.	Gold saved.
	Pesos.	*Pesos.*	*Pesos.*	*Per cent.*
Original ..	211.26	76.80	84.00	39.7
Original put through 60-mesh ..	211.26	67.36	143.90	68.0
Original put through 80-mesh ..	194.20	49.60	a174.60	74.4
Original tube-milled, 79 per cent. through 100-mesh.	169.82	15.22	a154.62	91.0

aVariations in sampling or else actual loss of gold by grinding.

The tests were made by revolving the ore in a bottle with mercury and a little sodium hydroxide, for one hour. The mercury was panned out and dissolved in nitric acid and the gold cupelled to give check on the assay of the tailings. It is very unlikely that any machine or system of plates will give an equivalent extraction on the finer meshes.

Conclusions.—Only 39.7 per cent. of the gold in the original can be amalgamated. Grinding releases more and more gold until with very fine grinding 91.0 per cent. of the amalgamable gold is released. Tube-milling, followed by plates, will probably give much less than 91.0 per cent. extraction.

Cyanidation tests.—Cyanidation tests were made on the original, at various meshes and in combination with amalgamation. Important results were obtained.

Cyanidation tests on sample No. 1.

Test No.	Product.	Extraction by amalgamation.	Extraction by cyanidation.	Total extraction.
				Per cent.
1	Original	39.7 per cent ..	Product not cyanided ..	.. ..
2	Original	Product not amalgamated.	25 per cent. in 24 hours..	.. ..
3	Original put through 60-mesh	21.10 per cent ..	57 per cent. in 48 hours..	73.5
			82.3 per cent. in 96 hours	89.0
4	Original put through 100-mesh	23.16 per cent ..	92 per cent. in 48 hours..	96.0
			93.7 per cent. in 96 hours	96.5
5	Original tube-milled 98 per cent. through 150-mesh ..	59.7 per cent ..	97 per cent. in 48 hours..	99.0
			91.1 per cent. in 96 hours	99.1
6	Original tube-milled 98 per cent. through 150-mesh ..	Product not amalgamated ..	80 per cent. in 24 hours..	.. ..
			98 per cent. in 96 hours..	.. ..

The strength of the solution was 0.29 per cent. potassium cyanide: the pulp ratio was 3:1; the consumption averaged 5 pounds per ton of ore; lime was added and agitation employed in all cases. Tests 3, 4, and 5 were first pulverized, then amalgamated, and the tails cyanided. Test No. 6 was tube-milled and cyanided direct.

Conclusions.—Fine grinding, agitation, and considerable time are necessary, and will give an extremely high extraction. When the coarse gold can not be powdered by the tube-milling, amalgamation may be necessary.

COMMERCIAL CONCLUSIONS

The amount of table concentrates at present saved is too small to warrant the installation of an expensive plant for either amalgamation or cyanidation.

The following table shows the relative advantages of shipping concentrates with and without magnetic separation and of local treatment in Huntington mills.

Comparison of shipment of concentrates and treatment in Huntington mill.

[Values in Philippine currency.]

Items.	Magnetic separation and shipment.	Shipment of original per ton.	Huntington mill.
		Pesos.	*Pesos.*
Value of original ..	One ton worth 200 pesos separates to 0.58 ton worth 194.42 pesos.	200	200
Cost of treatment ..	16 pesos for 0.58 ton	30	2
Extraction	185.00 pesos	190	140
Profit	169.00 pesos	160	138

The greatest profit is to be obtained by magnetic separation and shipment of the product. The least profit is to be obtained by treatment in the Huntington mill. The comparison between magnetic treatment and direct shipment is quite close. Therefore, for the present it would be more advisable to ship direct without magnetic treatment. More tests should be made to determine the efficiency of magnetic treatment and the feasibility of installing machines.

FUTURE POSSIBILITIES

The question of how to save the black sands is not within the scope of this paper. It has been shown, however, that after the sands are saved, they can be successfully treated by several methods.

The amount of black sand in the gravel is very large and even rough concentration should give for a dredge some 10 tons per day worth over 30 pesos per ton. Experiments should be made with the Richards pulsator jig and other machines to see if a concentrated product can be obtained cheaply. It might be possible to obtain a considerable amount of concentrates by means of a more extended series of riffles and more frequent cleanups.

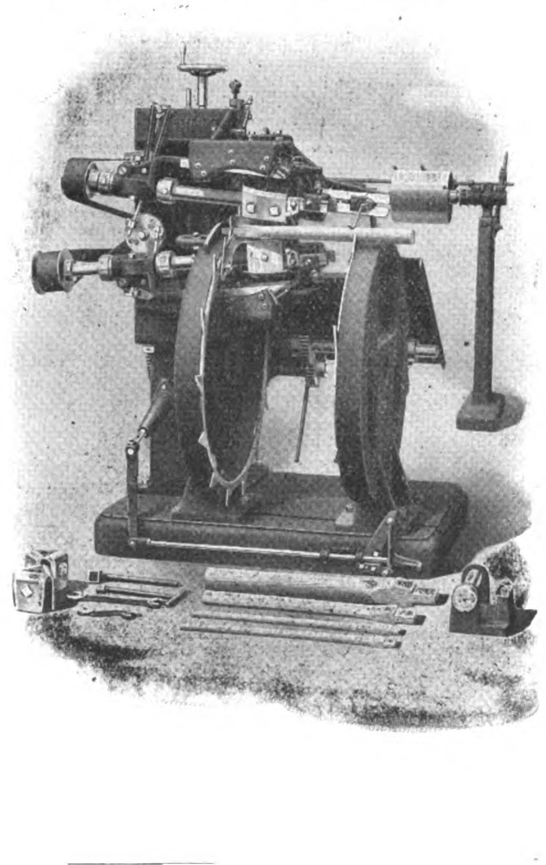
With several dredges in operation sufficient concentrates should be obtained to warrant the erection of a central cyanide plant. It would seem that tube-milling in cyanide solution followed by air-agitation, decantation, and the usual precipitation would give an especially high extraction at nominal cost.

AUTOMATIC SPOKE THROATING MACHINE

This Engraving represents the No. 1 Automatic Spoke Throating Machine, manufactured by the Defiance Machine Works, which is used by spoke, wheel and wagon manufacturers to rapidly and accurately throat both sides of spokes at one pass through the machine. It is calculated to handle either small or large spokes in Common, Sarven, Warner, and Sharp-edged patterns at the rate of 12,000 per day, doing the work smooth and securing any shape of throat desired.

The Column is massive and mounted upon a broad, heavy base. The saddles supporting the cutter head spindles are gibbed to the column and provided with a vertical adjustment by hand-wheel to regulate the thickness and position of throat and size of spokes. Both cutter heads can be adjusted together to regulate the position of the throat with the tenon, without altering the adjustment for thickness of throat.

The Cutter Head Spindles are supported in substantial frames, which are attached to the saddles in ball bearings for securing the oscillating movements to the heads. An ingenious equalizing device is fitted to the spindle boxes to secure a uniform oscillating movement



The Feeding Reels are driven by cut gearing and a friction clutch connected by a convenient foot pedal for instantly starting or stopping the feed. The outside reel turns faster than the one on the inside to carry the spokes to the cutter head in a circular path for throating thinner on the face than back of spokes, similar to that important feature secured heretofore by the hand-feed throater. A cam shoe is fitted to each cutter head box near the heads, and as the spokes are fed to the heads the cam shoes travel over the barrel of the spokes and oscillate the cutters in a path to correspond with the shape and size of spoke fed into the machine.

The Spokes to be operated upon are simply placed upon the feeding reels, which automatically present them to the cutters, when both sides are treated at one time and the finished spokes are discharged into a rack at the rear of the machine.

A Counter is furnished as follows: Shaft, 1 1/16" × 60"; two floor stands, 44" high; tight and loose pulleys, 10" × 5"; speed, 1,000 revolutions per minute; one three-step cone pulley for feed.

Further information covering this machine can be secured from its builders, the Defiance Machine Works, Defiance, Ohio, U. S. A.

RAILWAY AND TELEGRAPH LOANS

The following is a letter from the Ministry of Communications to the Ministry of Finance regarding repayments of Railway and Telegraph Loans due in September:—

As the railroads and telegraphic establishments under the management of our Ministry were all built with foreign capital, the Goverment is responsible, as stated in the contracts, for the making up of all monthly deficits in case our Ministry should fail to clear the monthly instalments of capital and interest. For years, however, these monthly deficits for which the Government was responsible had been made up by our Ministry and the sources from which money had come to pay these monthly instalments had been according to the budget of the second fiscal year, the net profits of the three lines, the Peking-Mukden, the Peking-Hankow, and the Peking-Kalgan.

But now things have turned out quite contrary to what we expected. The Peking-Hankow line, for more than one hundred *li*, has been damaged by flood, which naturally results in diminished income. The Peking-Mukden line has recently been strained financially by the non-payment in cash of the fees on the part of the Government for the transportation of troops. The telegraphic office has not received any pay for the sending of messages from the Central or the Provincial Governments, which amounts to a total credit of more than a million. The Peking-Pukow line now being employed solely for military purposes, all its expenses have had to be defrayed by our Ministry, and so it is needless to say anything of its producing profits or prospect of paying its own capital and interest.

Hence the utter impossibility of our paying the instalments due this month, which have already amounted to the sum of $3,800,000. At the beginning of this fiscal year, as soon as we foresaw that income would not meet the outlay, we have put, under the heading of receipts, the subheading "loan" to provide for deficiency; but now the income has been so meagre that the conclusion of a foreign loan is for the time being made impossible. Besides the $500,000 which we have been conceded not to pay temporarily on account of our financial stringency, the whereabouts of the remaining $3,300,000 is yet unknown.

Duringt this time when the concentralization of power over the finance of the nation is to be effected, in conforming to the rule, we hereby submit the following list of unpaid instalments. We will do our best to devise means to dispose of them, but whether we will be successful in our attempt or not, it is yet uncertain. The difficulties we have above enumerated, we cannot help from explaining for fear that trouble may arise from some misunderstanding:—

REPAYMENTS due for to Native and Foreign Loans in September, 1913.

Loan	Instalment Number	Due Date	Repayment of Capital & Interest	Total	Chinese Currency	Payee
Kirin-Changchun Railway Loan	8th	Sept. 14	Yen 53,750	Yen 53,750	$59,125	Southern Manchuria Railway Company
Tientsin-Pukow Railway Loan	11th	Sept. 17	£125,000	£125,312½	$1,378,437.50	Deutsch-Asiatsche Bank.
Industrial Loan	10th	Sept. 25	£125,000	£125,000	$1,377,750	Hongkong & Shanghai Bank and Chartered Bank.
Shanghai, Chefoo & Taku Main Cable Line.	22nd	Sept. 30	£6,794	£6,794	$74,734	Great Eastern & Great Northern Cable Co.
Shanghai, Chefoo & Taku Sub-cable Line.	24th	Sept. 30	£1,576	£1,576	$17,336	Great Eastern & Great Northern Cable Co.
Peking-Hankow Redemption Loan Bonds	10th	Sept. 30	£15,750	£15,750	$173,250	Dunn Fissher & Co.
Ditto	10th	Sept. 30	Yen 77,000	Yen 77,000	$84,700	Yokohama Specie Bank.
Ditto	10th	Sept. 30	$11,893	$11,893	$11,893	Bank of Communications, Peking.
Hunan Railway Nationalization Loan	1st	Sept. 30	$698,000	$698,000	$698,000	Bank of Communications. Hunan.
				Grand Total	$3,875,225.50	

FAR EASTERN RAILWAYS

CHINA

Peking-Hankow Railway.—The following is a comparative statement of the receipts of this railway for the first seven months of the year:—

January	$ 557,781.50	$1,473,813.69
February	331,076.33	685,260.16
March	970,082.21	1,342,299.53
April	1,266,818.78	1,249,222.55
May	1,329,740.03	1,587,388.78
June	912,640.68	1,221,372.44
July	820,761.86	1,127,515.10

Hai-Lan Railway.—The Hai-lan Railway office at Kaifeng has started buying land for the line, says the *Peking Daily News*, and continues: But for various reasons, there are frequent frictions between the railway authorities and the villagers. In measuring the land, the custom has been to use the bamboo tape, which is less liable to expansion or contraction, but it is said that the railway authorities are using the flax tape, and the land-owners are complaining that the measurements are unfairly made.

The Hukuang Railways.—So many circumstances in connection with the Hukuang Loan for the construction of the railroads from Hankow to Canton and Szechuan were changed by the Revolution and the subsequent failure of the Government to secure a permanent Director-General for the lines, that the Banks interested in the loan were compelled to come to special arrangements with the Chinese Government to provide for the protection of bondholders.

To this end a special conference was recently held in Peking between the chief engineers and accountants of the lines and the Banks, and regulations were drawn up and agreed to by the Ministry of Posts and Communications for the proper transference and disbursement of loan funds. These regulations will ensure the loan monies being devoted solely to the construction of the railways, and will secure for the Chinese a line of the most economic and efficient kind. The regulations are to provide against waste and misappropriation, and the Board of Posts and Communications will surely be pleased to see something being done to this end.

Work is now being pushed ahead on both the southern and western lines, and within a few months distinct progress should be noticeable.

The *Central China Post* of September 5 reports:—The first mile of line has been completed in the Hankow-Canton Railway. Construction work was commenced on August 1, but general work is waiting the discussion now going on in Peking between the Four Powers' banks, the Board of Communications, Mr. Collinson, Engineer-in-chief of the British section, and Linow of the German section. The recent troubles have in some way been the cause of the present delay in remitting the money and the present conference is to contend with conditions that have arisen. The last conference was to have taken place yesterday and prospects are bright that a favourable arrangement will be arrived at. The first piece of construction in this centre is taking place near the glass factory above Wuchang. This is only a branch line to a market on the river. Only about two hundred coolies are at present being employed. The main line will run behind Wuchang to the terminus proper on the river bank on the Wuchang side opposite the German Concession. Here will be the necessary sheds and offices. The position of the terminus was chosen so as to connect the Canton line with the Kin-han railway at Kilometre Ten, connection being made by ferry. There will be placed a specially planned pontoon on the Wuchang side. This will be fitted with a crane and will also be connected by rail with the shore, so that rolling stock will be able to be transported across the river and run on to the Canton line. The purchase of land is proceeding but is hampered by a boom in the land market which occasions the land owners to value their land at prohibitive prices. Notwithstanding, speed is being made in the erection of the telegraph lines along the route so that there will be ready communication between the different construction centres when work starts. It is expected that the line to the Canton border will be completed in four years and, the Canton province section having been completed by the same time, the journey to Canton will be made in thirty-six hours.

[The conference proved successful, and the engineers have returned to their sections. Mr. Frank Beckwith has gone over the whole of the American section and has located the route. An early start on construction is anticipated. Mr. Beckwith subsequently resigned his post.—Ed. F. E. R.]

Yunnan Railway Project.—The *Hongkong Daily Press* of August 25 says:—We learn that at the end of July, a German firm offered the Provincial Government of Yunnan a loan of £3,000,000 to build the Poseh-Ting railway. The issue price was fixed at 95 and interest required at 5½ per cent. per annum. The agreement contained 22 clauses and, among the stipulations were the following:—

(1.)—That principal should be used, without deductions of any kind, to build the Yunnan-fu-Poseh railway.

(2.)—The actual route of the railway to be decided by the lenders of the money, but in the event of objection by the people to the location proposed, then the route shall be changed.

(3.)—That the Goverment of Yunnan in the event of their requiring mining machinery, arms, ammunition, munitions or material for war, arsenal machinery, railway machinery, industrial plant or any foreign material or supplies whatsoever, shall give the first refusal of such contract to the lenders, and if the price quoted by them, for such plant, be equal to or lower than other bids, quality being equal, they shall be awarded the contract during the term the loan contract endures.

(4.)—That the lenders of the capital shall have the right to work such mining areas along the line of the railway route, or within a distance to be determined later, provided that such areas are not worked now by native owners or workers.

(5.)—The railway shall belong to the lenders of the capital until the final instalment in repayment of the loan is paid.

"Should such a contract go through," our informant says, "it will destroy all active competition in the province—undoubtedly the richest mining province in China."

Taonanfu-Sinminfu Railway.—The Government projected the Taonanfu-Sinminfu Military Railway some months ago and proposed to construct it at once, in order to facilitate the transportation of troops and supplies to the Mongolian frontier, but the matter was put off for lack of funds. It is said that an appropriation has now been made for this railway, and the work on this line will be commenced very soon. This railway will pass throngh Changtufu.—*Peking Daily News.*

The Lotung Railway.—When the Government declared that the Lotung Railway should be state-owned, the gentry and commercial people of Honan made violent protests, says the *Peking Daily News*. But since Liu Ko, Manager of the Lotung Railway came to Peking, negotiations have been progressing smoothly, and it has been decided that the first step to be taken is to try and buy up the shares, thereby testing the attitude of the people. Now the Kaifeng Branch of the Bank of Communications reported that over $900,000 worth of shares had been bought up by the Government, and as the total capital of the said line being $1,300,000, the sum represented by this purchase made by the Government was far in excess of 50% of the total capital. This fact indicates the willingness of the people to hand over the control of this line to the Government. The Ministry of Communications has sent Secretary Chen Yuan-sun, and Mr. Chang-ho, to audit the accounts of the Lotung Railway Company. This railway has now been duly taken over. Mr. Orphanides, accompanied by Hsu Wen-chung, Engineer of the line, have duly taken over all the construction works of the line. On August 19th, the Lotung Railway was officially put under the control of Mr. Sze Shao-tsen, Director-General of the Lung-Tsin-U-Hai Railway.

SHANGHAI-NANKING RAILWAY

The following figures of traffic returns (approximately) for the week ended August 16 are issued by the Shanghai-Nanking Railway:—

For the week

Year.	Passengers.	Goods and Sundries.	Total for the week.
	$	$	$
1913....	22,142	4,819	26,961
1912....	35,900	12,174	48,074
Increase.	—	—	—
Decrease	13,758	7,355	21,133

For thirty-two weeks.

Year.	Passengers.	Goods and Sundries	Total
	$	$	$
1913....	1,488,439	329,688	1,818,127
1912....	1,456,434	235,119	1,691,553
Increase.	32,005	94,569	126,574
Decrease	—	—	—

Woosung Line traffic resumed on morning of August 14. Main Line traffic was closed for one day, the 14th instant, between Changchow and Tanyang. Instructions were issued to open up to Chinkiang on the 16th instant, orders were cancelled, however, before being put into operation.

Week ended August 23.

For the week.

Year.	Passengers.	Goods and Sundries	Total for the week.
	†23-8-13.	†23-8-13.	†23-8-13.
	$	$	$
1913....	24,762	4,642	29,404
1912....	36,122	9,859	45,981
Increase.	—	—	—
Decrease	11,360	5,217	16,577

For thirty-three weeks.

Year.	Passengers.	Goods and Sundries	Total
	$	$	$
1913....	1,513,201	334,330	1,847,531
1912....	1,492,556	244,978	1,737,534
Increase	20,645	89,352	109,997
Decrease	—	—	—

† On average of 145 miles open.
Traffic opened for one day only (19th) to Chinkiang.

Week ended August 30.

Year.	Passengers.	Goods and Sundries.	Total for the week.
	For the week		
	†30-8-13.	†30-8-13.	†30-8-13.
	$	$	$
1913....	29,008	6,424	35,432
1912....	35,465	7,134	42,599
Increase.	—	—	—
Decrease	6,457	710	7,167

For thirty-four weeks.

Year.	Passengers.	Goods and Sundries.	Total.
	$	$	$
1913....	1,542,209	340,754	1,882,963
1912....	1,528,021	252,112	1,780,133
Increase.	14,188	88,642	102,830
Decrease	—	—	—

†On 161 miles open.
Trains running to Chinkiang from 24th.

Week ended September 6.

For the week.

Year.	Passengers.	Goods and Sundries.	Total.
	$	$	$
1913....	†32,954	†6,937	†39,891
1912....	41,067	9,599	50,666
Increase.	—	—	—
Decrease	8,113	2,662	10,775

For thirty-five weeks.

Year.	Passengers.	Goods and Sundries.	Total.
	$	$	$
1913....	1,575,163	347,691	1,922,854
1912....	1,569,088	261,711	1,830,799
Increase.	6,075	85,980	92,055
Decrease	—	—	—

†On 161 miles open.
As only one train ran to Nanking on the 6th, it has been disregarded in estimating the mileage open. There was no train from Nanking.

Week ended September 13

For the week.

Year.	Passengers.	Goods and Sundries	Total for the week.
	$	$	$
1913....	58,322	6,704	65,026
1912....	38,309	9,432	47,741
Increase.	20,013	—	17,285
Decrease	—	2,728	—

For thirty-six weeks.

Year.	Passengers.	Goods and Sundries.	Total
	$	$	$
1913....	1,633,485	354,895	1,987,880
1912....	1,607,397	271,143	1,878,540
Increase.	26,088	83,252	109,340
Decrease	—	—	—

JAPAN

Joto Light Railway Company.—The Joto Electric Railway Company, promoted by Count Hirosawa Kinjiro and Messrs. Satake Sakutaro, Mochizuki Unai, and Hoshino Seki, held its first general meeting on August 20 at the Tokyo Chamber of Commerce, the shares having all been taken up. The proposal is to lay a main line connecting Yanagishima, Hoiyo and Urayasu, Chiba Prefecture, and a branch line to Matsudo, Chiba prefecture. The total length of the railway will be eighteen miles, and the capital of the company one million *yen*. Count Hirosawa, the Chairman of the organization committee, was in the chair, and made a detailed report on the proceedings of the organization of the company. After the estimates of the company and the organizing expenditure to the amount of 9,000 *yen* had been approved a few amendments in the articles of association were passed.

Revenue Returns.—The returns of State railways for the month of July were 8,802,312 yen, being an increase of 800,529 yen on the figures for the corresponding period last year. The total returns since April up to the end of July are 37,414,504 yen, with an increase of 1,672,545 yen as compared with the corresponding period of last year.

New Lines.—As a result of the administrative readjustment the construction of new railway lines has for the most part been postponed, but the following fourteen lines being too important to put off are now under construction. They will, according to the authorities, be completed within the next year or so:—

Line	Section	Mileage	Date of expected completion
Heavy Railways			
Shinjo....	Kiyokawa to Sakata	16.57	Dec. 1914
Ganetsu...	Nozawa to Tsugawa	19.14	Sept. 1914
Murakami.	Shibata to Chujo ..	8.08	April 1914
Murakami.	Chujo to Murakami..	12.50	Sept. 1914
Taira.....	Miharu to Shinmachi	20.66	March 1915
Hojo.....	Kisaradzu to Minato.	14.63	Jan. 1915
Hamada ..	Oda to Ota	10.61	Nov. 1914
Tadotsu ..	Kanonji to Kawamae	9.63	April 1914
Sarki.....	Oita to Kosaki ..	11.58	April 1914
Light Railways			
Funakawa.	Mita to Wakimoto ..	5.54	June 1914
Nagai.....	Nashigo to Nagai ..	7.12	July 1914
Miyachi..	Kumamoto to Otsu..	13.75	April 1914
Miyachi...	Otsu to Shimano ..	10.68	March 1915
Oita......	Oita to Nakahonda .	7.23	April 1914

Royal Cars.—The Imperial Japanese Railway authorities will construct special railway cars for their Majesties the Emperor and Empress and their attendants to be used on the occasion of the Coronation ceremony next year. The work of construction is to be commenced shortly at the Shimbashi railway works, and the necessary timber is now being prepared. The new cars are to be completed by about August next year.

Abolition of the First Class.—The Imperial Japanese Railway authorities have decided to abolish first-class cars on local services. According to the *Asahi* first-class cars were to be discontinued on trains between Yoshimatsu and Kagoshima, and both first and second class between Yoshimatsu and Tanigashira on the Kagoshima line, from the 16th August. The present system of running three-class trains in Japan was adopted from the English example. The Osaka journal considers the *car de luxe* unnecessary on the Japanese trains, which it describes as being no larger than a coffin, but it urges the improvement of the third-class service, a long journey in a third-class car being a severe ordeal. Our contemporary hopes the improvement of the third-class will go hand-in-hand with the abolition of the first.

Increase in Revenue.—According to Japanese papers, the revenue of the Government railways this year has been satisfactory. The total gross revenue for the four months ending July last amounted to Y37,391,850, comprising Y19,197,591 receipts from passenger traffic and Y18,194,259 from goods traffic, an increase of about Y1,000,000 on estimated revenue. If the present state of things is maintained, it is considered, there can be no doubt that an increase of over Y3,000,000 will be shown at the end of the financial year on March 31st.

Light Railway at Tokushima.—The Railway Board granted a charter dated September 1 to the Anan Railway Company for the construction of a light railway to connect Hanoura village with Hirashima village in Naga district, Tokushima prefecture. The length of the light railway will be 1 mile and 31 chains, with a gauge of 3 feet 6 inches. The cost of construction is estimated at 65,000 yen.

Konosu-Omama Railway.—The Bando Railway Company has been formed with a capital of Y1,000,000. The company proposes to lay a line between Konosu, Saitama Prefecture, and Omama, Tochigi Prefecture, with a total mileage of 29 miles, and another line connecting Konosu with Hachioji, 32 miles in length.

Moji Harbour Railway.—Rear-Admiral Takino and other prominent men are planning to start the Moji Harbor Construction Railway at an outlay of 2,000,000 yen. The promoters and supporters of the project will take 30,000 shares, and the remaining 10,000 shares will be offered to public subscription. The proposed railway will, it is expected, facilitate communications between Moji harbor and Sonezawa, thus aiding the business concerns to carry coal to Moji from the neighboring colliery.

Heavy and Light Lines.—As a result of the nationalization of the railways in Japan the expansion of the heavy railways under private management has come practically to an end, while the tramways and light railways have just commenced their expansion. According to the Government Railway Board the private heavy railway companies number ten with a total mileage of 391 miles. Of these seven lines, 253 miles in length, are already open to traffic, while two lines, 103 miles in length, are in course of construction. The building of the remaining lines, which will be 35 miles in length, has not yet been commenced. Light railways being easy to lay and being, moreover, heavily subsidized by the Government, have increased in number remarkably of late years. At present the light railway companies number 208 and the total length of the lines under their management is estimated at 3,328 miles. Of these 38 companies with lines 574 miles in length are already in operation, while 44 companies with a mileage of 800 miles are in course of construction. The remaining 126 companies with a projected mileage of 1,953 miles, are still in the stage of promotion. Besides these quite a large number of applications for the laying of new lines are receiving the attention of the Board. The expansion of the tramways keeps pace with the expansion of the commercial and industrial towns. There are at present 124 tramway companies operating lines 1,082 miles in length. Besides these there are fifty-eight companies which have not yet completed their lines. These will have a total length of 815 miles when completed.

Kokura Railway Co.—The general meeting of the Kokura Railway Company was held recently when Mr. Mudaguchi Gengaku, the president, presented from the chair the business report for the half year, and recommended a dividend of 5 per cent. to be declared. The meeting accepted the report and passed the proposal for the dividend. Mr. Sonoda Sanenori was nominated Adviser to the Company.

MANCHURIA

South Manchuria Railway.—The S. M. R. Traffic Returns for August give Y1,333,966 against Y991,990 for the corresponding month of last year. The aggregate returns since April reach Y7,868,519, being an increase by Y1,839,975.

SIAM

A Proposed Line.—A Bangkok journal makes brief mention of a proposed line of railway to connect with the Bangkok-Petchaburi line at Ban Pong, on the Meklong. If carried out it would no doubt do a great deal to open up a stretch of very fertile but sparsely populated country which possesses great possibilities. Ban Pong is some 111 miles from Bangkok and is quite a thriving place. The line would no doubt prove of great benefit in linking up lower Burma with Siam, and thence with the Federated Malay States and Straits Settlements.

The Northern Line.—In a letter from Chiengmai, dated the 24th July our (*Bangkok Times*) correspondent stated that work on the tunnel at Khoon Tan was proceeding satisfactorily. Enquiries made at the Royal Railway show that the top-heading on the Lampang side is 75 metres in, and the bottom 40 metres, and on the Chiengmai side 85 metres and 10 metres respectively. Work is not being pushed at all, and indeed would not be undertaken in this particular place were it not absolutely necessary. But by the time the rails are at Khoon Tan it is hoped the tunnel will be finished. But for that fact work would not be continued there, as the cost of the same is almost prohibitive. To give an instance, what is known as a big barrel of cement in Bangkok is equal to ten small barrels up-country, and each retails at one tical. The transport from railhead to the tunnel adds another Tcs. 2.25 on to each barrel. But still the cement is absolutely necessary, as at least part of the tunnel must be lined. The Laos labour at work here and elsewhere along the line varies of course according to the season of the year—naturally during planting time the supply is smaller, but the system of utilising Laos labour is not to be changed. Nearly two years' experience with these men has proved that they are cheaper than Chinese. Moreover the money they earn stays in the country. Some idea of the proportion of Chinese to local labour employed may be gained from the following figures. In the section from Den Chai to Lampang, under the charge of Mr. Altmann, the number of men employed during June was Lao 1,170, Chinese 200. On the further section, Lampang to Khoon Tan, a few hundred more men are working; the bulk are working in their own country.

The next stretch of line to be opened will be to a place called Pak Tar, where the Meh Tar stream joins the Meh Yom. It is situated some 30 kilometres from Den Chai and 563 from Bangkok. It is proposed to open this line on November 1st. This brings the railways to the banks of the Meh Yom which has to be bridged by three spans of fifty-eight metres each. During the last dry season the piers were placed in position, and in the coming dry season the iron superstructure will be erected. A good deal of material was carried over this river last dry season. A track was made across the river bed and much of the permanent way material for the line ahead moved. By this means it is hoped to reach Bang Pin next month with plate laying. This will be the next section to be opened, and may be in use as and from April 1st next.

Bang Pin is four kilometres away from Muang Long, and about an hour's walk. The latter place is the seat of the Amphur. Now in the rainy season a ferry service is being maintained across the Meh Yom to transport goods as required. Just beyond Muang Long the line reaches the foot of the hills. To avoid running round a somewhat lengthy spur of some eminence it was decided to have a short tunnel of some 140 metres. The top heading of this is already through and although the roof proves to be a hard slate it has been deemed advisable to line the roof, and this is now being done. The line here is really at the foot of the Bang Puei pass, and this involves heavy work. There will be no tunnel, but a big cutting has to be made. It is hoped to have the line running to Lampang by the end of 1915, and in any event it will be ready early in 1916. To Chiengmei, 756 kilometres from Bangkok, by train will be possible two years later. The work of preparing for the actual way of the line across the great rice plain leading from Lampoun to Chiengmai is being carried on.

One of the problems which the next few years will solve is whether the line will be utilised by the timber firms to transport timber. On this point it is difficult at the present time to pronounce definitely, but in railway circles the view is held that ultimately the railway will give a cheaper transport to Bangkok than by river. At present it is no unusual thing for logs to take some two or three years to reach Bangkok, and a writer in the *Times* last year gave it as five years from forest to mill. The capital locked up in this way must run into big figures.

Now that the line has reached the Meh Yom, in two days from there logs could be delivered into the Menam Chao Phya from the riverside station at Bangkok. For logs coming down the Meh Yom, Pak Pan and Pak Tar would both be good places for loading on rail. It is also quite possible that better places could be found hereabouts, as the line follows the river for some distance. Anyone who has seen the Meh Yom when jammed with logs and no water to float them, will agree that a case has been made out for a trial of transport by rail. It is said that logs cost nothing to float, but there are certain charges to be met, and whether a log is floated or carried on rail makes no difference to its condition—they are seasoned before being floated. Of course approaches would have to be made, and winches installed for loading, and before any definite arrangement could be come to the authorities would have to largely increase their present stock of timber drags. In Burma, we understand, the railways are more and more used for the conveyance of timber. The railway now being built will not open any new teak areas, but will provide an alternative to floating. That the changing conditions are being realised may be inferred from the fact that inquiries as to probable cost of transport by rail have been made. If the railway view is correct, Paknampoh as a riverine revenue station will have much less to do in the future than it has now. Millers would also be able to keep their mills running the year round, instead of having to shut down when a succession of short deliveries reduces stocks to too fine a point.

Paknam Railway Co.—At the forty-fourth ordinary general meeting of this company the following report was submitted:—Your Directors beg to submit to the shareholders the statement of accounts for the half-year ended 30th June, 1913.

Gross Receipts		Tcs. 94,381.78
Expenses		„ 25,534.76
Leaving a profit for the half-year of		Tcs. 68,847.02
Written off Concession	Tcs. 14.70	„
Depreciation	„ 6,955.00	„ 6,969.70
		Tcs. 61,877.32
Balance from half-year ended 31st Dec., 1912		„ 2,430.38
Available for distribution		Tcs. 64,307.70

This amount was apportioned as follows:—

By paying a dividend of 9½%	Tcs 47,500.00
By paying Directors' Fees	„ 5,000.00
By paying Auditor's Fee	Tcs. 390.00
By paying Manager's Bonus	„ 2,375.00
By paying Staff Bonus	„ 800.00
By carrying to Statutory Reserve	„ 2,665.62
By carrying forward to next half-year	„ 5,577.08
	Tcs. 64,307.70

GENERAL

Sino-Japanese Through Traffic Agreement.—The Sino-Japanese Through Passenger Traffic Agreement was to come into force on October 1st.

For through passenger traffic between the Peking-Mukden Line and the Chosen Railway through the medium of the intervening Mukden-Antung Line, the following through traffic stations have been named:—

IN CHOSEN

Fusan, Nandaimon (Seoul), Pingyang, and Chinnampo.

IN CHINA

Hsinmintun, Shanhaikwan, Tientsin, and Peking.

The availability of through tickets between the Chinese and Korean Lines is fixed for 20 days, whilst those between the Japanese Government Railways and the Peking-Mukden Line will hold good for 30 days.

The free weight limits of passengers' baggage are agreed upon as follow:—

For a 1st class passenger.....150 lbs.
„ 2nd „ „ .....100 „
„ 3rd „ „ ..... 80 „

The difference in the standards of currency in Japan and China is a source of great trouble to the Railways concerned in the distribution of their respective proportions, but they have agreed that in principle the passengers' interests shall have precedence in the exchange process.

The majority of through passengers between the S. M. and the Peking-Mukden Lines being coolie immigrants and emigrants riding the lowest class, the S. M. Railway will continue to calculate the respective shares of receipts from this particular source by its official exchange rate as it fluctuates from time to time, and will also continue to issue through tickets at the stations specified for the purpose in a separate agreement between the two Railways.

Projected Lines.—It is reported at Peking, says the *China Critic*, that the Chinese government has in view several railway schemes in South Manchuria. One of them is to lay a line between Tiehling and Mafengkou (the river mart on the Liao), another from Kaiyuan to Sunchatai, a third from Antung to Tashihchiao *via* Tatungkou and Hsiuyen, and a fourth, and the most important of all, from Kungchuling to a Mongolian trade centre.

BRITISH NORTH BORNEO

British North Borneo Lines.—Speaking at the 61st half yearly meeting of the British North Borneo Company on July 15, at London, the Chairman of the Court of Directors, the Right Hon. Sir West Ridgeway, said *inter alia:*—With regard to the railway, a considerable amount of work was carried out during the year in reconstructing and strengthening the line and in repairs to and renewals of locomotives and rolling stock. This included an expenditure of £31,988, which has been charged to capital. You will observe that the auditors in their report take exception to our having charged to capital the sum of £13,961 thus expended in the reconstruction of the line. They made the same objection last year, and I went fully into the matter. I stated:—"With regard to the railway, you will remember that I told you at the meeting here last July that the cost of improving the line and bringing it into a proper and efficient condition would not fall short of £100,000. In the year under review we have

spent about £28,000 in improving and strengthening the line. In this connection you will observe in the auditors' report that they take exception to our having charged to capital the sum of £5,643 expended on the reconstruction of the line (which is included in this sum of £28,000), they being of opinion that that amount should have been charged to revenue. This railway was in the first instance constructed with rigid economy, merely as a pioneer line, and was intended to attract capital to the country and to promote the opening up of rubber and other industries. Accordingly it was decided that the whole of the expenditure should be fairly and properly chargeable to capital. Now, owing to the great increase of traffic, in consequence of the establishment along almost its whole length of a number of rubber companies, we have decided to reconstruct the whole line and make it into a strong and durable railway. In order to do so we must resleeper the line, substitute heavier rails than those hitherto in use, strengthen or rebuild the bridges, and very largely increase the number of locomotives and rolling stock. It is estimated that the cost of this work will be over £100,000, and I promised you last year that it should be charged to capital, and unless you wish us to charge it to revenue we propose to adopt this policy, which we consider to be sound and fair to the shareholders. I may point out to you that even when we have expended the £100,000, to which I have referred, on the reconstruction of the line, the total cost of the whole 125 miles with ample rolling stock and full equipment will amount to less than £700,000, or about £5,400 per mile. That amount compares most favourably with any other railway in a tropical country."

The net railway revenue for 1912, as I have already mentioned, shows a considerable increase over 1911, the gross earnings amounting to £20,911, as against £16,936 in 1911, an increase of £3,975. The total number of passengers carried in 1912 was 201,877, against 175,339 in 1911, showing an increase of 26,538. With regard to the goods and other traffic there were 14,184 tons carried in 1912, against 10,451 in 1911, an increase of 3,713 tons, whilst the number of head of live stock carried also shows a small increase. Since the beginning of the year 1913 the increase in the receipts has been steadily maintained, the total for the five months ending May 31 last amounting to £9,858, which gives an average for the whole year of £23,650, or an increase of more than £2,700 over that of 1912.

During this year considerable work will be done in relaying the main line with heavier rails, 60lb. rails being substituted for the 30lb. rails now in use; much will also be done in strengthening the bridges, the wooden structures being replaced by steel work, thus making them strong and permanent. Another scheme in hand is the removal and extension of the locomotive workshops, the present buildings being too cramped and the site too small to admit of extension. All this work, although involving considerable capital expenditure, will, as time goes on, amply repay us by the increase receipts.

The railway rates charged are very reasonable.

PUBLIC WORKS

Schemes in Siam.—The Government has a scheme in view for constructing a road across the peninsula from Langsuen to Renong, and an engineer is to be dispatched by the Ministry of the Interior to survey it.

The lock at Bang Hai, which is constructed to prevent the salt water getting in from the sea at Bangkok, is now completed. The work was commenced about nine years ago under Mr. Van der Heyde, and originally estimated at G. $111,250; the total cost has been about G. $222,500. The work consists of a tidal sluice to prevent the salt water going up the klong, a navigation lock, and an earthen dam, and at this point the klong is 300 feet wide and 26 feet deep. It is hoped that by this work the large area of the land drained by Klong Bang Hai will be reclaimed for cultivation.

IRON AND STEEL

Angat (P. I.) Iron Mining Co.—Incorporation papers have been filed with the archives division of the executive bureau at Manila by the Angat iron mining and smelting company. Its activities are given as the development and exploitation of iron mines in the Philippine Islands; the buying and selling of mines; the reducing of ore by smelting, etc. The capital stock is P100,000 and is divided into 4000 shares at a par value of P25 each. P20,000 has already been subscribed and P14,000 paid into the treasury.

Pig Iron.—It is reported that the restoration of the accommodation of the Hanyang Iron foundry has been completed, and it is now turning out 600 tons of pig iron daily. The first consignment of 2,600 tons was sent to Japan recently. Of the annual output of 216,000 tons, it is reported that arrangements have been made for importing 100,000 tons to Japan this year. Besides this, Japan foundries have contracted for the importation of about 30,000 tons from the Tata Iron & Steel Company of India. The report on the irons from this company's works, made by Messrs. Pattinson and Stead, of Middlesbrough, states that "they are all of very excellent quality, and owing to their richness in carbon and lowness in sulphur, would bear mixing with a very large amount of scrap iron; but better results would be obtained by an admixture of close forge Tata iron, low in silicon and carbon and high in sulphur. Taking the price of Hematite pig iron at an average of 66s. per ton and Cleveland pig iron at 55s. per ton, the market price of Tata pig iron on the average would be approximately 64s. per ton. The present price of Hematite pig iron is 82s. per ton and of Cleveland pig iron about 64s. per ton. Reckoned on these bases the price of Tata pig iron should be approximatety 78/3 per ton."

SHANGHAI TRAMWAYS

The returns of the Shanghai Tramways (Foreign Settlement) for the week ended August 20, are as under:—

	1913. $	1912. $
Effective receipts (after deducting loss by depreciation of subsidiary coinage)	18,660.66	15,003.40
Passengers carried	984,227	783,134
Car miles run	59,354	52,771

The loss by depreciation of subsidiary coinage for the week was $5,515.98 equal to 23.93 per cent. of the gross cash collected on the cars as compared with $4,483.01 equal to 24.45 per cent. for the corresponding week last year.

Week ended August 27, 1913:—

	1913. $	1912. $
Effective receipts (after deducting loss by depreciation of subsidiary coinage)	17,954.34	14,503.29
Passengers carried	963,978	761,602
Car miles run	59,321	50,923

The loss by depreciation of subsidiary coinage for the week was $5,425 29 equal to 24.39 per cent. of the gross cash collected on the cars as compared with $4,336.51, equal to 24.53 per cent. for the corresponding week last year.

Month of August, 1913, and eight months ended August 31, 1913, with figures for corresponding periods last year.

	August, 1913. $	August, 1912. $
Effective receipts	83,223.99	68,321.88
Passengers carried	4,404,056	3,565,223
Car miles run	262,613	236,191
Loss by depreciation of subsidiary coinage	24,666.08	20,436.80
Percentage of loss by depreciation of subsidiary coinage	23.99	24.42

	8 months ended Aug. 31, 1913 $	8 months ended Aug. 31, 1912. $
Effective receipts	593,314.86	517,760.46
Passengers carried	30,301.293	26,334,708
Car miles run	1,881.732	1,829,324
Loss by depreciation of subsidiary coinage	165,734.97	159,772.59
Percentage of loss by depreciation of subsidiary coinage	23.09	25.12

Week ended September 3, 1913:—

	1913. $	1912. $
Effective receipts (after deducting loss by depreciation of subsidiary coinage)	19.255.90	16,497.76
Passengers carried	1,029.264	868,295
Car miles run	58,731	54,119

The loss by depreciation of subsidiary coinage for the week was $5,697.03 equal to 23.93 per cent. of the gross cash collected on the cars as compared with $4,936.90 equal to 24.32 per cent. for the corresponding week last year.

Week ended September 10, 1913:—

	1913. $	1912. $
Effective receipts (after deducting loss by depreciation of subsidiary coinage)	18,508.54	16,173.85
Passengers carried	1,003,423	846,822
Car miles run	56,251	53,465

The loss by depreciation of subsidiary coinage for the week was $5,465.33 equal to 23.99 per cent. of the gross cash collected on the cars as compared with $4,739.52 equal to 23.97 per cent. for the corresponding week last year.

Week ended September, 17, 1913:—

	1913. $	1912. $
Effective receipts (after deducting loss by depreciation of subsidiary coinage)	19,255.77	15.635.42
Passengers carried	1,043,245	823,944
Car miles run	56,833	52,502

The loss by depreciation of subsidiary coinage for the week was $5,630.73 equal to 23.78 per cent. of the gross cash collected on the cars as compared with $4,629 64 equal to 24.25 per cent. for the corresponding week last year.

WATERWORKS, IRRIGATION, ETC.

Dairen City Waterworks.—The question of extending the installations at the source of water-supply for the Dairen Waterworks service was brought up again at the recent budget conference of the Kwantung Government. The estimate, amounting to about Y1,300,000 for employment over four years was passed. The appropriation for the next fiscal year is about Y300,000. As the very nature of the question brooks no further haggling for financial or other reasons, it is very unlikely to be shelved again as it was this year.

Tokyo Water Works.—The following information is from the report by the British Vice-Consul at Yokohama (Mr. C. J. Davidson) on the trade of that district in 1912: —A plan to extend the Tokyo waterworks system is now under consideration by the municipality. The present system, which was designed to supply some 1,500,000 persons, is considered quite inadequate in view of the rapidly increasing population, which is now estimated as exceeding 2,000,000. It is proposed, therefore, to expand the system so as to provide water for 3,000,000. For this purpose a reservoir is to be constructed at a spot some 25 miles to the west of Tokyo, from which point the water will be conducted by underground pipes to a distributing centre six miles from the capital, where it will pass through filter beds before being supplied for consumption. Of the estimated cost the Treasury will be asked for a grant of some £714,000—or one-third—the remainder to be raised by means of a municipal loan.

SHIPBUILDING

The Taikoo Dockyard and Engineering Co.—A Hongkong paper reports as follows:—The Taikoo Dockyard and Engineering Co. of Hongkong, Ld., have just completed a very finely modelled steel screw steamer built to the order of the Bureau of Customs, Manila. The vessel has been named "Gilbert," and is 165 feet long over the figurehead, 25 feet beam, and 15⅛ feet moulded depth, and has been built equal to the highest classification of Lloyd's Society.

The vessel, with its clipper stem, surmounted with a neatly carved eagle and sweeping trail-board, and long overhanging stern, has a graceful, yacht-like appearance. She has a continuous main deck with long shade deck over, and is rigged as a fore and aft schooner.

A powerful quick warping windlass is fitted in the bows to handle the stockless anchors. The crew are berthed under the main deck forward, and abaft the crew space is a large fresh water tank, also a magazine fitted up with the usual flooding and draining arrangements.

On the main deck forward is a steel house containing rooms for engineers, pantry, bath and saloon. The saloon is handsomely fitted up in polished teakwood.

The captain and officers are accommodated in a teak house on the shade deck. On the after part of the shade deck is a teak house containing Suite de Luxe, panelled in oak and furnished in the most approved manner. Midships on the shade deck is a house for the wireless operator.

Triple-expansion engines and two powerful boilers of the builder's own make have been fitted.

The steam steering gear is housed at the aft end of the engine casing and a Remington refrigerating machine has been fitted in a similar compartment at the aft end of the casing, with a large cold storage compartment under the main deck aft.

The vessel is fitted throughout by electricity and has a powerful searchlight fitted on the fore mast.

Launch of the "Tai Shan."—The Tai Shan, built to the order of the Hongkong, Canton and Macao Steamboat Company by the Hongkong and Whampoa Dock Company, was successfully launched from their yard at Kowloon recently, Mrs. H. P. Holyoak performing the launching ceremony. The Tai Shan is a steel twin-screw vessel constructed to Lloyd's requirements, and the equipment is in conformity with Board of Trade regulations. Her chief dimensions are length over all 290 feet, breadth at main deck 53 feet, and moulded depth, 12 feet. The stability of the vessel, which is shallow draught, is ensured by water ballast tanks fitted all fore and aft, on the cellular system. There are three decks, providing ample accommodation for passengers who when the vessel is complete will find that she bears favourable comparison to the rest of the company's fleet in the matter of provision for their comfort. The carrying capacity is 397 tons on a mean draught of 8 feet 1¼in., the vessel being designed for a speed, when so laden, of fifteen knots. That this speed will be attained on trial is anticipated, the machinery being capable of 3,000 indicated horse-power steam being generated in four single-ended boilers working at 180lbs. pressure.

King of Siam's New Launch.—Although the motor launch is frequently patronized by royalty, it is not often that sleeping accommodation is provided in any but the largest yachts. In this respect, therefore, the large cruising launch now completing by Messrs. Dixon Bros. and Hutchinson, of Southampton, for His Majesty the King of Siam is different from the majority of royal launches. In cases where economy of space and cost are no consideration, the designers of motor craft are left free to produce a vessel which will command admiration by reason of the luxury which it suggests, and the broad scale upon which its accommodation is conceived. The launch in question is 55 ft. in length over, all with 10 ft. 9 in. beam, 5 ft. 3 in. moulded depth amidships and 3 ft. draught. She is driven by twin screws, power being provided by pair of 75 h.p. petrol motors fitted with reverse gears. When completely fitted out for a cruise, and with passengers and crew on board, the total displacement of the launch is 15.7 tons, and in this condition it is expected that a speed of 16 knots will be attained.—*Siam Observer.*

MINING

Chosen Gold Mines, Ltd.—At the 1st ordinary general meeting of shareholders of the Chosen Gold Mines, Ltd., held at the Company's registered office at Caxton House, Westminster, London, the Directors submitted the following statement of accounts to the shareholders:—

The Directors beg to submit herewith Statement of Accounts, duly certified by the Auditors, covering the period of fifteen months, from the incorporation of the Company when it took over the property of the Korean Exploitation Syndicate, to May 31st, 1913.

The period under review has been devoted solely to prospecting and developing work, which the Directors are glad to be able to say has proved, on the whole, satisfactory.

The Shareholders have already been afforded an opportunity of perusing the Report recently made upon the Kok Kang Kol Mine by Messrs. Hooper, Speak and Company, which Report gives full particulars of the work done at that mine. From this Report they are aware that sufficient ore has been developed to warrant the installation of a small initial milling plant, which is now in course of erection, and it is expected will be in full operation before the end of the year.

The necessary additional machinery required to operate the mine is already in transit from America, and as soon as it reaches Kok Kang Kol the work advised in Messrs. Hooper, Speak and Company's Report will be carried on still more vigorously than is now possible, but already favourable indications have been found at the bottom of the winze put in on the advice of their representative, Mr. A. H. Curtis.

The following particulars will afford a good idea of the work that has been done since the incorporation of the Company.

In order to comply with the laws of Japan and to enable the Company to operate in Chosen (Korea) it was necessary that it should be officially recognised by the Government Authorities in Korea, and it was not until the 17th March last that permission to establish the Seoul Branch Office was published in the official Gazette. This delay in the recognition of the Company has caused our first year's operations to be somewhat difficult, more particularly in regard to the transfer of the various properties already acquired into the name of the Company. One cause of the delay lay in the fact that the Chosen Gold Mines, Limited, was incorporated almost simultaneously with the promulgation of new laws concerning companies operating in Korea. Official recognition has now been obtained, as likewise of the Company's Agent in Seoul, who has been instructed at all times to render strict compliance with the Japanese Government requirements, which are both reasonable and consistent in character.

The title of the Company to the Kok Kang Kol Mine is now established, the permit being dated 16th May, 1913, over the seal of the Governor-General. The claim had up to then been held in trust for the Company pending its official recognition. The area of the claim is 334,001 tsubo, or about 278 acres, over which the Company has exclusive mining rights. The Company has bought the freehold of such portion of this ground as will be required for surface operations. Transfer of this is now being effected.

The total driving and sinking work done at the Kok Kang Kol Mine during the period under review amounted to 5,346 feet, which covered the sinking of shafts, the driving of the main adit and the various cross-cuts and shafts therefrom. Prospecting work has also been conducted on other claims, notably the Yung Piun, Peh Ju and Koo Sung Mines. The results encountered at the three properties last referred to have not been encouraging, and it is the intention of the Board to confine its entire efforts at present to the development of the Kok Kang Kol Mine, particularly as the erection of the mill will place the property upon a profit earning basis.

Mining in Banka.—According to the *Indische Mercuur* of July 29 the *Java Bode* writes on this subject:—"A few years ago it was decided to proceed with the mechanical working for tin in the Boeboes valley, in the district of Blinjoe, in the Residency of Banka, by means of an electrically-driven sluicing suction installation. The construction of the power station near Mantoeng (in the Klabat Bay) has been delayed, but its completion may soon be expected. The centralisation of motive power in connection with the tin workings will be pushed forward, because the acquisition of wood for fuel for the large number of scattered steam installations is gradually becoming more difficult, and, moreover, proves very costly. For instance, in the districts of Merawang and Pangkalpinang all the available wood in the proximity of the workings is almost used up. Moreover, only certain kinds of wood are suitable for charcoal. In the majority of cases such wood as is not suitable for timber is also not suitable for charcoal. To give an idea of the quantity of wood necessary for the smelting works at Banka we would point out that during the last few years about 200,000 cubic metres of wood have been used per year. It is evident that such an immense quantity of wood cannot permanently be obtained in the proximity of the workings, and that consequently the wood must be obtained at greater distances, and the result thereof is that the charcoal is continually becoming more expensive. Furthermore, a large number of workmen are required to obtain the wood, which workmen could be much better employed at the workings themselves. This difficulty will be felt even more severely in the future if the importation of coolies, which has been fairly satisfactory during the last few years, becomes again more troublesome. It has therefore been decided, in principle, to construct a very large power-station for the districts of Soengeiliat, Merawang, Pangkalpining, and Soengeislan, the cost of which will amount to more than 1½ million guilders (about £125,000)."

Talacoman (P.I.) Mining Co.—Incorporation papers of the Talacoman Mining Company were filed recently in the executive bureau, Manila. The company will exploit mining claims in the Agusan district of the island of Mindanao. Its directors are John C. Mehan, E. C. McCullough, Patrick Mortimer, E. E. Elser, R. J. Harrison, Alfredo Roensch, and B. W. Rice. Mr. Rice has been elected treasurer.

The capital stock is P.100,000, divided into 1,000 shares of a par value of P.100 each. Of this stock, P.50,400 worth has been subscribed to and paid in.

Kailan Mining Administration.—The total output of the Administration's mines for the week ended August 16, amounted to 38,455.55 tons and the sales during the same period to 32,594.71 tons.

Week ended August 23, total output 35,534.11 tons, and sales during the same period 31,685.27 tons.

Week ended August 30, total output 40,425,83 tons and sales during same period, 31,345.22 tons.

Week ended September 6, total output 34,458.03 tons and sales during the same period 35,929.64 tons.

Siamese Tin.—The report of the Siamese Tin Syndicate Limited states that the year's working resulted in a net profit of £40,822. Two interim dividends of 10 per cent. each, making together 20 per cent., have already been paid, leaving a balance of £16,822, out of which the directors recommend a final dividend of 10 per cent., carrying forward £4,822. The directors have decided to apply the sum £22,745 standing at credit of share premium account in writing off the following amounts from the respective accounts appearing in the balance-sheet:—Preliminary expenses, £740; expenditure in Siam, £18,967; Ngow development account, £2,406; buildings and furniture, £297; boats and lighters, £70; workshop purchase and erection, £248; buffaloes, £15. The returns for the three months to July 1st amount approximately to £15,200, as compared with £11,200 last year for the same period. As the shareholders are aware, No. 2 dredge has already been shipped, and will shortly be on the property. No. 3 is well in hand, and will follow at an early date. Each of these machines has more than double the capacity of No. 1. Since the date of the last report, the company has acquired an option over a property in Malacca, where boring is now proceeding with a view to testing its value. The ordinary general meeting took place in London on the 28th July.

COMPANIES

Bangkok Manufacturing Co.—At the half yearly meeting of this company held recently the accounts for the half year ended June 30, 1913, were adopted. These showed that the gross profits on the Company's operations for the six months amounted to Ticals 46,560.13. From this amount must be deducted the sum allowed for Depreciation as per Profit and Loss Account, viz. Tcs. 14,998.16, leaving Ticals 31,561.97. From this amount must be deducted Ticals 1,629.57 brought forward from last half year, leaving a total available of Ticals 29,932.40, from which must be deducted:—

Staff Bonus	Ticals 2,273.70
Auditor's Fee.. ..	" 400.00
	Ticals 2,673.70

leaving a nett amount of Ticals 27,258.70 available for distribution. This amount was dealt with as follows:—

Dividend at the rate of 4 per cent.	Tcs. 16,000.00
Directors' Fees	" 3,000.00
Carry Forward	" 8,258.70

Japan Paperware Co.—This company has been organised at Tokyo with a capital of Y500,000.

Hokkaido Gas Co.—This company made a net profit during the last half year of Y32,367.-34 and declared a dividend of 6 per cent.

Chosen Gas and Electric Co.—This company made a net profit of Y41,048 for the past half year and declared a dividend of 8 per cent.

Grand Hotel, Ltd. (Yokohama).—This company made a net profit during the last half year of Y42,753.73 and declared a dividend of Y5 per share.

Minami Nippon Sugar Manufacturing Co.—This company made a net profit of Y59,320.18 during the last half year, wrote off Y29,489.04 and carried forward Y22,753.58.

Kabuto Brewery Co.—This company made a profit of Y94,516.32 during the last half year and declared a dividend of 7 per cent.

Niitaka Sugar Manufacturing Co.—This company made a net profit during the last half year of Y2,396.39 which, with the balance of Y89,403.92 from the last account, was carried forward.

Shanghai Cotton Manufacturing Co., Ltd.—The appropriation of balance at credit of profit and loss account for the year ended June 30th, 1913, was made as follows at a recent meeting of this company:—

	Tls.
To depreciation	55,749.70
Carry to fund reserve for equalisation of dividends	200,000.00
To reserve for repairs and renewals	100,000.00
Pay to shareholders per share a dividend of Tls. 6.00	
And a bonus of Tls. 4.00	
Tls. 10.00, viz. :	200,000.00
To credit of new account. . . .	11,747.94
	Tls. 567,497.64

FINANCIAL

Industrial Bank of Japan.—At a general meeting of the Industrial Bank of Japan, Governor Shidachi announced a fiscal plan to cover the depreciation of the securities in the bank's possession, and the loan to the Hasami gold mine, the recovery of which is considered uncertain. Mr. Shidachi, addressing the shareholders, said that the Bank's investments at the end of June were as follows:

	Yen
National and Prefectural bonds. .	18,157,158
Shares and Bonds	5,149,701
Gold and Silver mine.	3,862,719
Industries	54,202,469
Total	81,372,047

The total shows an increase of 4,125,833 yen. as compared with that at the end of the previous half year.

"One important proposal which I take the liberty of submitting to you at this general meeting is about the depreciation of the negotiable bonds in the Bank's possession and about bad debts concerning mines. The accounts in this connection had to be adjusted sooner or later, and I believe that we have reached the time when the adjustment should be made. In consequence I propose that we cut down the valuation of the negotiable bonds, appropriating a portion of the reserves for the purposes, and the dividend shall be made for the first half of this year at the rate of 5 per cent. per annum. After this, the bank will be supplied with special industrial funds, so as to increase its revenue. This will enable the bank to increase its dividend and to reserve a fund against the bad debts. This plan was sanctioned by the Government, and it has the promised co-operation of the Bank of Japan and others. Thus an arrangement has been made possible for the bank to obtain the special fund. I regret that we had to reduce the dividend for the term concluded, but hope it will be for the ultimate benefit to the bank." The 5 per cent. dividend was agreed to.

The account was approved as follows:

	Yen
Receipts for the term	2,433,013
Brought over from last term . . .	51,187
Total	2,484,201
Special reserve	380,000
Dividend Equalization Fund . . .	423,056
Grand Total	3,287,257
Losses for the term	2,797,757
Net Profit for the term	487,500
Distributed as follows:	
Reserve Against Losses	40,000
Dividend Equalization Fund . . .	10,000
Dividend at 5 per cent.	437,500

Chartered Bank of India, Australia and China.—A telegram has been received from the London Office of this Bank stating that the Directors have declared an interim dividend for the past half year at the rate of 14 per cent., free of income tax. The interim dividend for the corresponding half last year was 13 per cent.

Bank of Chosen.—In the course of his address at the eighth ordinary general meeting of shareholders of the Bank of Chosen (Korea) the Governor of the Bank, Dr. M. Ichihara, said:—"Turning to the country's trade with Japan and other countries, and relation of the Treasury *vis-à-vis* the market, both of which exercise great influence over the money market here, the total amount of trade during the half-year was yen 49,813,090, showing an increase, as compared with the figures for the corresponding period of 1912, of yen 6,141,483, of these figures, the imports, at yen 35,231,712, showed an increase of yen 5,493,958 and the exports, at yen 14,581,378, an increase of yen 647,535, showing an excess of imports over exports for the half year of no less than yen 20,650,334, which is larger by yen 4,846,423 than that for the corresponding half-year of 1912. Thus it will be seen that though imports and exports both increased, the expansion of exports was hardly more than 4.6 per cent., whereas that of imports reached as high as 18.4 per cent., resulting in a 30 per cent. increase in the excess of imports. While an unfavorable trade course is unavoidable in a new country in the course of rapid development as Chosen now is, the difference would not be so great as this, but for the exceptionally unfavorable export trade prevailing for the past few months. Of the articles imported, the enormous increase in the importation of Manchurian millet and foreign rice is a fact worthy of note. It amounted altogether to yen 3,925,576, equal to no less than 80 per cent. of the total increase in the imports. This indicates that the Koreans are forming the habit of consuming cheaper food stuffs while disposing of the more costly rice that they themselves produce —a new economic phenomenon in this country. Turning to the relation of the Treasury *vis-à-vis* the market, the total receipts amounted to yen 107,003,369 while the disbursements totalled yen 117,347,834, showing an excess of disbursements over receipts amounting to yen 10,344,465—a decrease of yen 2,355,851 on the figures of a year ago. This decrease in the Treasury money released on the market, though an unavoidable result of the Administrative Adjustment, proved no small blow to the still rudimentary economic life of this country."

The net profits for the half-year amounted to yen 223,083.98, to which had to be added yen 10,105.16, brought forward from last year, making a total of yen 233,187.14, which was apportioned as follows:—

	Yen.
Dividend at the rate of 6 per cent. per annum on 70,000 shares (30,000 Government shares excepted). .	157,500.00
Reserve fund to provide for losses .	39,900.00
Reserve fund to equalize dividends.	7,250.00
Bonus and Allowances.	15,600.00
Balance carried forward to next account.	12,937.14
	233,187.14

The Yunnan Loan.—The Yunnanfu correspondent of the *North-China Daily News* wrote on August 27 as follows:—The Provincial Government has received the sanction of the Central Government to a proposed provincial loan of $4,000,000 to be applied to the development of the Kokiuchang tin mines, the purchase of machinery for the Tungchwan copper mines, the purchase of a waterworks plant for Yunnanfu, and various other purposs. Three offers have already been made: one by Carlowitz & Co., whose Hongkong manager recently paid a visit to Yunnan; another by an American syndicate represented by the agent of the Singer Sewing Machine Co., and the last by the Yokohama Specie Bank, whose representative has just lately arrived.

No British or French firms have been able to tender for the above mentioned loan owing to the well-known policy of the two Governments, who discourage provincial borrowing. In this connection some little misunderstanding was caused owing to the fact that Messrs. Carlowitz's representative in this loan, Mr. Laurenz, happens to be a director of the Hongkong and Shanghai Banking Corporation.

Yokohama Specie Bank.—A general meeting of the Yokohama Specie Bank was held on September 10 at Yokohama, and the following account for the first half of this year was approved:

	Yen
Gross earnings	22,308,304
Gross expenditure	18,928,535
Balance: net profit	3,379,769
To reserves	350,000
To dividend (12 per cent per annum)	1,800,000
Carried forward	1,229,769

Mr. Mizumachi, President of the Bank, spoke on the general situation as follows:

The economic condition in Japan during the first half of the year was free from the stringency of last year, but was generally quiet. The foreign trade was brisk and the total of exports and imports reached 68,900,000 yen. The financial world did not have any special cause of depression, but could not be said to be recovering its prosperity.

The money market slackened a little. The Oriental Development Company issued a foreign loan of 20,000,000 yen, and the Government one of more than 100,000,000 yen; the Government at the same time redeemed 5 per cent. bonds amounting to 30,400,000 yen and railway bonds amounting to 45,000,000 yen. It issued Chosen bonds to the amount of 300,000 yen. Towards the end of the term the market tightened slightly, owing to the varied demands for commercial and industrial funds,

In the foreign trade, exports amounted to 284,520,000 yen, and imports to 404,980,000 yen, the total reaching 689,500,000 yen, showing an increase of 55,050,000 yen in exports and of 54,930,000 yen in imports, the total increase being 109,980,000 yen as compared with the corresponding term of last year. The increase of exports was due to the brisk trade in raw silk and habutaye and to the prosperous business done with China. The increase of imports was largely due to rice and Java sugar.

Commerce and industry in Europe were making a wholesome progress on the whole About March and April, its money market improved and the Bank of England reduced its rates to 4½ per cent. Then the Balkan troubles were renewed, but the Bank of France maintained its rates of 4 per cent., and the Bank of Germany that of 5 per cent.

The Democratic Government of the United States made the merchants and manufacturers doubtful as to its policy, and business was slack. Moreover, the Balkan affair made the European market watchful and America had to export gold to Europe to the extent of $100,000,000 affecting the financial and stock markets there. Besides, the Paterson strike injured the raw silk trade.

In the Orient, India had a prosperous trade, exporting large quantities of cotton to Japan. North China was not affected by the civil war, and Japanese cotton yarn is selling so well that it is about to beat all its rivals.

Shanghai merchants made various business preparations in expectation of the conclusion of the five Power loan. But as its conclusion was delayed, silver depreciated and there were a few failures as a consequence. When it was concluded the internal strife broke out and the trade did not prosper as expected.

But Manchuria was not affected by the strife and the general trade conditions were normal and the export of Manchurian beans prospered.

VLADIVOSTOK HARBOUR

Vladivostok Harbor.—The increase of trade at Vladivostok has made the question of extending shipping facilities an acute one. Both anchorage and wharfage are far below requirements, and ships have to wait as much as three weeks for their turn to unload. Plans for harbour improvements at a cost of 1,600,000 roubles have been sanctioned by the Russian Government and the work of repair and extension is expected to begin shortly.

PERSONAL

Mr. John Van A. MacMurray, who has been appointed Secretary of the American Legation in Peking will arrive about November 22nd, Mr. MacMurray has been in the Diplomatic Service since 1907, and has served as Secretary of the American Legation in Siam, and as Second Secretary of the Embassy at St. Petersburg. He has been on duty in the Department of State, Washington, since April 1911. Lately he has been the Chief of the Near Eastern Division.

H. E. Sir John Jordan, K. C. M. G., H. B. M. Minister to China, will not be able to leave London for Peking until early in November.

Mr. J. W. O. Davidson of the British Legation at Peking has been transferred to the Consulate-General at Canton.

Mr. E. T. Williams, Charge d'Affaires of the American Legation at Peking, will be appointed Chief of the Division for Far Eastern Affairs of the Department of State at Washington.

With the departure of the Japanese Consul-General Mr. Obata, the senior consulship in Tientsin falls to the American Consul-General, Mr. S. S. Knabenshue.

Dr. Mizumachi, President of the Yokohama Specie Bank, has resigned and has been succeeded by Mr. Junnosuke Inouye.

Captain T. C. FitzHugh, M. V. O., Chief Commissioner for the British Engineers Association at Peking, visited Shanghai during September and met a number of those interested in engineering matters, to whom he explained the aims and objects of the Association.

Sir Charles Eliot, Chancellor of the Hongkong University, who has been in Peking during the summer months studying the Chinese language, has returned to Hongkong.

Mr. Frank L. Crone has been appointed Director of Education in the Philippines in succession to the late Mr. Frank R. White. Mr. Charles H. Magee has been appointed Assistant Director and Mr. John D. De Huff as Superintendent of City Schools in Manila.

The resignation of Mr. Dean C. Worcester Secretary of the Interior, Philippine Islands, became effective on September 15.

It is reported from Berlin that Herr von Haxthausen, German Minister to Peking, intends to return to Peking in the middle of October.

Mr. Müller, Russian Consul-General in Tabriz. has been appointed Diplomatic Agent in Urga.

Dr. Tokichi Masao, a legal adviser of the Government of Siam, who recently resigned his post after many years of invaluable service, was summoned to the Siamese Court recently and, in the presence of Royal Princes and State Ministers, the King personally conferred on him the First Order of the Royal Crown, at the same time granting him an annual life pension of 5,000 ticals.

THE UNIVERSITY OF HONGKONG

(*Continued from page 137*)

must soon. It is so therefore of national importance to Great Britain that the young men who are destined to control should receive their first and most lasting impressions from British teachers and British appliances.

"I use the words "national importance" advisedly. It has already been stated in *The Engineer* that American firms offered fully to equip the Hongkong University with mechanical and electrical appliances. When this was made known about fifty British firms sent offers, and I doubt not that what is still wanted will be forthcoming before long.

"The German Government officials have urged, and are urging German firms to take a hand in technical education in China, and our other competitors are no less active. In fact, it is recognised everywhere but in Downing-street that the struggle is now a national one, and that the first position to be contested is that of education. Fortunately, we have the vantage ground of Hongkong and a University there with British professors and British tools. This should help us to hold what we have till the British Government acknowledges and acts on the fact that a commercial nation cannot afford to be ashamed of or indifferent to, its commerce.

"Some of the well-known firms of British engineers have already signified their willingness to take post graduates from the Hongkong University into their works for a year or two, and the students are ready to accept their offer when the time arrives. This cannot but be of mutual advantage."

POWER STATION AT BANGKOK

(*Continued from page 138*)

Co. The concrete is put into wooden moulds over the iron bars, and as the posts are made of a lattice work pattern they are ornamental as well as useful. They are constructed so as to give strength in the direction in which it is required, and are much stronger than the old circular wooden posts. There is an iron continuation at the top as a lightning conductor in conjunction with the iron formation of the posts, which are in two sizes of eleven and eight metres each. The scheme of making these posts is another invention to the credit of Mr. Gollo.

There is a handsome approach to the station, and when all is completed it will form an attractive addition to Bangkok's public buildings. Mr. Shaw is the Engineer-in-charge, and the A.E.G. are the Chief Contractors. It is also stipulated that they run the station for twelve months after its completion.

BRIDGES IN INDIA

A bridge 769ft. in length is, says the *Railway News*, to be built over the Pazundaung Gorge on the extension of the Burma Railways. The work is being undertaken in order to link up the riverside districts of Rangoon. The structure will comprise three fixed spans of 165ft. each, a rolling lift span to give 100ft. clear opening for water traffic, and an approach span of 120ft.

A new bridge is shortly to be erected over the lower Ganges, 120 miles above Calcutta, on the system of the Eastern Bengal Railway. There will be 17 spans, the two appproach spans being 75ft. long, the others being 345ft. long, 49ft. high, and weighing 1,400 tons each. The bridge will be the largest ever shipped from England, and, with the exception of the Forth Bridge, it is said to be the largest yet built by British engineers.

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Mining Machinery
American Trading Co.
Melchers & Co.
Shanghai Dock & Engineering Co., Ltd.
Shewan, Tomes & Co.
New York Engineering Co-

Mineral Oil Plants & Machinery
A. F. Craig & Co.

Motors
Shanghai Dock & Engineering Co., Ltd.
Pratt's

Motor Launches
Shanghai Dock & Engineering Co., Ltd.

Paints Oils and Varnish
Standard Oil
Albany Lubricating Co.
F. A. Vander Loo & Co.
J. Dampney & Co.

Packing
Greene Tweed & Co.

Pulleys (Steel)
Schuchardt & Schütte
Shanghai Machine Co.
Shanghai Dock & Engineering Co., Ltd.

Pumps
The Goulds Manufacturing Co.
Shewan, Tomes & Co.
Jardine, Matheson & Co.
Shanghai Machine Co.
Shanghai Dock & Engineering Co., Ltd.
Joseph Evans & Sons

Railroads
Chinese Government Railways
Manila Railroad Co.
South Manchuria
Southern Pacific Co.
Chosen (Korea) Railways.

Railroad Supplies
American Trading Co.
American Locomotive Co.
Andersen, Meyer & Co.
Arnhold, Karberg & Co.
Baldwin Locomotive Work.
Fearon, Daniel & Co.
Hannoversche Maschinenbau A. G. Vormals Georg Egestorff.
Henschel & Sohn.
P. Herbrand & Co.
Jardine, Matheson & Co., Ltd.
Melchers & Co.
Mitsui Bussan Kaisha
Shewan, Tomes & Co.
Shanghai Machine Co.
Shanghai Dock & Engineering Co., Ltd.
Tyer & Co.
U. S. Steel Products Co.
Railway Signal Co., Ltd., The
Robert Dollar Co.
Samuel & Co., Ltd.
Dick, Kerr & Co., Ltd.
Avonside Engine Co., Ltd.
Siemssen & Co.
T. H. Symington Co.

Reinforced Concrete Construction
Shanghai Dock & Engineering Co., Ltd.
Trussed Concrete Steel Co.
U. S. Steel Products Co.

Roofing Paper
California Manila Lumber Commercial Co

Rope Manufacturers
Johnson-Pickett Rope Co.
U. S. Steel Products Co.
Ynchausti & Co.
Shewan Tomes & Co.

Ship-Chandlery
Ynchausti & Co.

Shipping Agents
Cia. General de Tabacos
Shewan, Tomes & Co.
Stevenson & Co., Ltd.

Shipbuilding and Repairs
Fiat-san Giorgio Ltd.
Tsingtauer Werft
Hongkong & Whampoa Dock Co., Ltd.
Kiangnan Dock and Engineering Co., Ltd.
Mitsu Bishi Dock and Engineering Works
Shanghai Dock and Engineering Co., Ltd.
Smith's Dock Co., Ltd.
The Taikoo Dockyard and Engineering Company of Hongkong, Limited
William Cramp & Sons.

Steamship Companies
Cia. General de Tabacos
Pacific Mail S. S. Co.
Ynchausti & Co.
Toyo Kisen Kaisha.

Steel Manufacturers
United States Steel Products Export Co

Steel Works
Bohler Bros. & Co., Ltd.
U. S. Steel Products Co.

Stokers
Babcock & Wilcox Ltd.

Structural Steel
Bohler Bros. & Co.
Shanghai Dock & Engineering Co., Ltd.
U. S. Steel Products Co.

Sugar Machinery
Honolulu Iron Works.
A. F. Craig & Co.

Superheaters
Babcock & Wilcox Ltd.

Tanks
Pacific Tank and Pipe Co.
Shanghai Dock & Engineering Co., Ltd.
U. S. Steel Products Co.
A. F. Craig & Co.

Telephones
The Western Electric Co.

Textile Machinery
A. F. Craig & Co.

Tiles and Bricks
Green Island Cement Co., Ltd.
Chinese Eng. Mining Co.

Tobacco Dealers
British-American Tobacco Co., Ltd.
Cia. General de Tabacos
Olsen & Co., Walter E.

Tools
American Tool Works Co.
Lodge & Shipley Machine Tool Co.
Shanghai Machine Co.
Easterbrook Allcard & Co., Ltd.
The Selson Engineering Co., Ltd.
Shanghai Dock & Engineering Co., Ltd.

Windmills
Defiance Machine Works.

Water Softeners
Babcock & Wilcox Ltd.

Wood Working Machinery
American Tool Works Co.
Defiance Machine Works.
Lodge & Shipley Machine Tool Co.
Shanghai Dock & Engineering Co., Ltd.

THE FAR EASTERN REVIEW

COMMERCE :-: ENGINEERING :-: FINANCE

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THE PHILIPPINE PROBLEM

By Geo. Bronson Rea

At a time when the momentous problem of China is drawing to its most acute stage, when the destiny of the hoary old country on the mainland of Asia, occupies the most serious thought of the chancelleries of Europe, coincident almost with the re-establishment of the sphere of influence doctrine in China with the probability of foreign intervention in the control of her internal affairs, and with all that this portends, comes the much heralded change in the American policy towards the Philippine Islands. Into the sizzling fry pan of Far Eastern politics and international intrigue for supremacy is thrown the rich, juicy and succulent morsel of an independent Philippine archipelago.

The Democratic party has lost no time in complying with its platform pledges to the country. In appointing the Hon. Francis Burton Harrison to the highly important and much coveted post of Governor-General of the Far Away Islands, President Wilson makes known to the world that he intends to carrry out the Democratic party obligations and has selected the man who, in his opinion, is best qualified faithfully to reflect his own high and lofty sentiments and sympathetically apply his ideals in the administration of the Philippines.

The appointment of Congressman Harrison to the exalted position of a Far Eastern ruler has been both commended and criticized by the American press, but the overwhelming concensus of opinion is that the appointment is a good one, and that Governor-General Harrison reunites all those qualities which make for success and which typify the highest ideals of American democracy. One of the most important qualifications of Congressman Harrison for the post of Democratic Governor-General of the Philippines lies in his emphatic and unswerving adherence to the principles embodied in the Philippine plank of the Democratic platform, which provide for the earliest possible severance of the ties which bind the Islands to America. As the Democratic party has announced its determination to comply with its pledges, it is natural that President Wilson should appoint one in whom he could implicitly rely faithfully and loyally to carry out the party program with honor to America and justice to the Filipinos.

In selecting Mr. Harrison, the President has again demonstrated that he possesses to a rare degree that faculty which makes for greatness in rulers; the ability to choose the right man to fill the place. Mr. Harrison has no previous training other than several terms in Congress for such an important executive post, but he is a lawyer and a keen student of men and character. Twelve years' experience on a Republican Ways and Means Committee, coming in contact with all kinds of people who have axes to grind, and high tariff schedules to maintain, provides a lively and interesting career and liberal education for a Democratic member pledged to a low tariff and to defend the rights of the consumer.

The papers in America and the Philippines had been anxiously awaiting a pronouncement of the policy to be inaugurated by the new Governor-General. To those who have given even the slightest attention to the progress of politics in America under the new *régime*, it must have been apparent that the only policy which could be applied would be in accordance with all of President Wilson's actions in living up to the party pledges, and that as far as possible the new administration would do its utmost to give expression to the Democratic National Platform adopted at Baltimore on July 2nd, 1912:

"We reaffirm the position thrice announced by the Democracy in national convention assembled against a policy of imperialism and colonial exploitation in the Philippines or elsewhere. We condemn the experiment in imperialism as an inexcusable blunder which has involved us in an enormous expense, brought us weakness instead of strength, and laid our Nation open to the charge of abandonment of the fundamental principles of self-government."

"We favor an immediate declaration of the Nation's purpose to recognize the independence of the Philippine Islands as soon as a stable government can be established; such independence to be guaranteed by us until the neutralization of the Islands can be secured by treaty with other Powers. In recognizing the independence of the Philippines our Government should retain such land as may be necessary for coaling stations and naval bases."

In sending Mr. Harrison to Manila, President Wilson is taking the first step towards the fulfilment of the above pledge, and the new Governor-General is a staunch advocate of granting the Islands their independence as soon as it can be done with honor to America and justice to the Filipinos. The new policy does not mean that the Islands will be granted their immediate independence on Wednesday next at half-past ten o'clock in the morning, as some of the Filipinos and Congressman Jones of Virginia would have it, thus leaving them to the mercy of predatory and powerful nations. Such an act of American cowardice is not a part of the Democratic policy.

The policy which Governor-General Harrison will follow in harmony with the administration at Washington is to lead the Filipinos by a friendly hand to the point where their independence can be assured to them by a treaty with the other Powers which will provide for the neutralization or internationalization of the Islands.

In other words the platform pledge is the keynote of the Democratic policy, and Governor-General Harrison will report to the President and to Congress as to the proper time when the Filipinos can be entrusted with the control of their own affairs. As a part of this program, the Filipinos are to be given a much large share in their own government. The Philippine Commission may be abolished and an elective Senate take its place, with the power of veto in the hands of the Governor-General. As far as possible, Americans in the public service are to be replaced by Filipinos and the control of affairs given into their hands.

Every effort will be made to fulfil the legitimate aspirations of the Filipinos and gain their hearts by making them friends, associates and equals. By kindliness and sympathy under the strong protecting influence of the Stars and Stripes it is hoped that they will be rapidly brought to that point where they will realize and live up to their responsibilities and hasten the day when they can stand alone.

There is practically no difference between the Republican and Democratic Philippine policies. Both parties recognize that the honor of their country demands the carrying out of their oft repeated promises to concede independence to the Filipinos, as soon as a stable government can be established. The Republicans maintain that it will take at least two or three generations under American tutelage before our wards will be sufficiently strong and capable of managing their own affairs.

The Democratic party has steadily adhered to the principles laid down in its National platform and desires to hasten the good work, and have done with our experiment before the Islands become a source of weakness to the Nation. They are willing to accept the oft repeated cry of the "gente illustrada" representing about ten per cent. of the Filipino population, that they are fully competent to manage their own affairs at once. The Democratic tendency is to take this element at its word as soon as it can be done without loss of dignity to the American people. In effect it is simply a question of time. When? that is the real problem.

President Wilson is inspired by the same lofty and altruistic ideals that characterized the attitude of his Republican predecessors towards the Philippines, and the problem that confronts him and Governor-General Harrison is how to harmonize American honor, and the Democratic party platform with our duty to the Filipinos and the other nations of the world, and our obligations to the race to assume ungrudgingly our share of the white man's burden.

There are, however, aspects of the Philippine problem which make it unwise and dangerous for the Filipinos to cut loose from America for many years to come. Americans and Filipinos are too prone to approach the question from a purely domestic viewpoint, and both ignore the large and intensely vital international phases of the situation. The Democratic party assumes that neutralization of the Islands, guaranteed by treaties, is the real solution. It is, provided the Philippines can be separated from the more complicated puzzle on the Asiatic mainland, and considered without its relation to the broader and more important political problem in the Far East.

Neutralization of the Islands by treaties with the leading Powers implies that the Filipinos have arrived at that stage of political development where they are competent to manage their own affairs, preserve law and order and guarantee the treaty rights of foreigners having commercial or industrial interests in the Islands. The Filipino people may firmly believe that they can do this successfully, and the American government may acquiesce, but it is doubtful if any of the European Powers or Japan can be persuaded to view the matter in the same light. No matter what ideas Americans or Filipinos may hold as to the fitness of the latter for self-government, it is difficult to believe that the older European colonizing powers are prepared to admit tacitly or constructively their own inefficiency by subscribing to any such treaty. It is inconceivable that the British government should be ready to acknowledge that American colonizing methods are superior to her own. If the Filipinos, after fifteen years under American tutelage, have arrived at that stage where they are competent to assume the full duties of citizenship in a guaranteed independent Republic, what answer can the British consistently make to the repeated demands of the educated classes in India for a much larger share in their own government?

It is possible that the leading nations of the world, out of courtesy and friendship to America, may be willing to enter into such a treaty, but only on the condition that the United States be responsible for the maintenance of law and order. The Democrats in their desire to hasten the day for relinquishing their trust, assume that neutralization as applied to Switzerland, Belgium, and Holland can be extended to the Philippines. The Swiss, Belgian and Dutch represent the highest type of the white race, their civilization is on a par with other European countries, and their citizens fully realize their responsibilities to the other Powers, and their governments are strong enough to enforce the laws within their own borders. They are worthy of the confidence reposed in them. Is it possible to extend the same international guarantees to an archipelago peopled by a race divided into many hostile elements, without a common language, and lacking in those higher attributes of civilization which make for peace and progress? Is it possible to guarantee the integrity of a group of Oriental islands, peopled in part by a savage and warlike race who for centuries have stubbornly resented and resisted the white man's yoke, and successfully defied all efforts to civilize them? No scheme of neutralization could possibly embrace the incorporation of the Moro or Mohammedan Islands within a Filipino Republic dominated by the Christian Tagalog or Visiyan tribes. Even the most ardent Filipino patriot would not care to assume the task of civilizing their inveterate enemies, unless their troops were led by American officers. This might be arranged, but the outlook for success would not be bright. The danger of fanatical outbreaks amongst the Moros of Mindanao and the Sulu Group once the fear of swift punishment is withdrawn by the departure of American troops from these islands, and the certainty that no Filipino force could preserve tranquillity for a month after independence was declared, tends to complicate the problem. The solution seems to be in treating the Moro provinces apart from the general Philippine question. If so, who is to assume control of these Islands? They cannot be turned over to a Christian Filipino Republic, nor can they be set adrift. America may retain these precious islands as a school for the army to practise in, but the American soldier has learned by sad experience that the Moro, like the American Indian, can only be civilized and brought under subjection by constant warfare. He believes that like the Indian, the only good Moro is a dead one, and as long as the white man or the Christian Filipino attempts to impose his authority on these Mohammedan fanatics, there will always be trouble, and if the task falls to the Americans, in the end they will all be good Moros. It may be accepted that in any solution to the Philippine problem with independence as the basis, the Moro provinces will have to be considered apart, and America would still be obliged to stand sponsor for their good behaviour, or hand them over to some other Power willing to assume that responsibility.

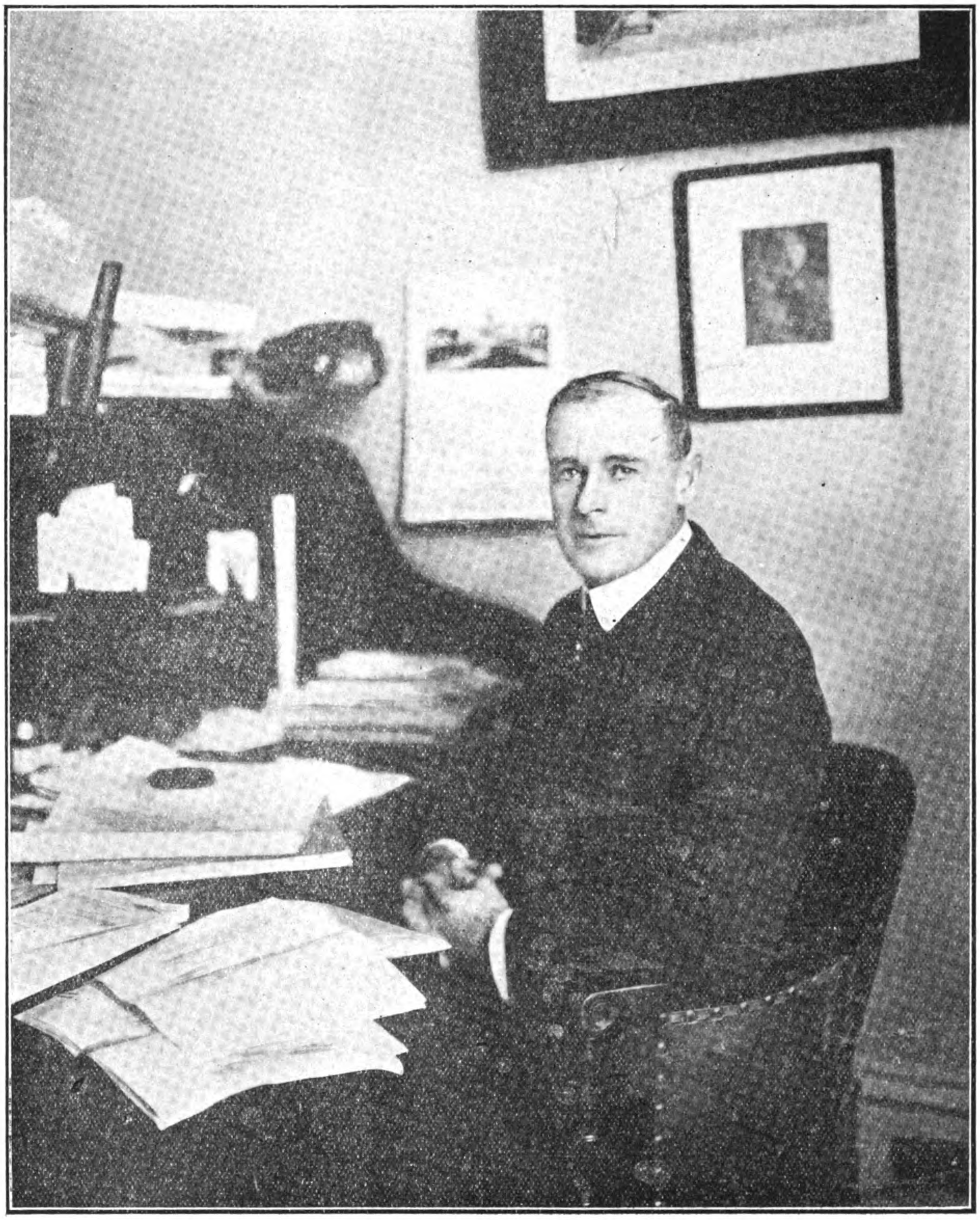
The Philippine Islands are one of the richest commercial prizes in the world, a prize other nations would never relinquish without a struggle. Under any other government but American, they would yield huge returns on the investment of capital. American capital will not flow into the Islands, but under other control their many resources would be rapidly and profitably exploited.

Why should the great Powers agree to the neutralization of a group of islands of such great richness and immense strategic importance? Because the American people can afford to be generous and altruistic in its dealings with the inhabitants of these Islands, and are unwilling to continue their responsibility, is that any reason why they should consent to the Islands being neutralized, when any little second or third rate European Power would be only too glad to take them over.

If, out of deference to America, the other interested Powers should agree to the neutralization plan, it follows that this guarantee would hold good just so long as the Filipinos behaved themselves, but at the first sign of internal trouble and injury to foreign interests, and the inability of the established government to cope with the disorder, the American government would be compelled again to exercise police powers.

Even if the Filipinos devote themselves seriously to their own affairs and refrain from internal dissentions and strife how long would they remain unmolested? The prize is too rich to be allowed to slip away from those who seek it. It would cost just about $25,000 in cash for some adventurer in the pay of a hungry foreign office or imperialistic commercial corporation to proceed to the Island of Samar, and start a small revolt, that would include the destruction of foreign property, loss of lives, etc. Before the bewildered Filipino government at Manila could realize what had happened, foreign warships would be on the spot, marines landed, and a huge indemnity exacted, or the cession of one of the many

islands demanded as compensation. And if one island went there would be a scramble for the rest. Do the Filipinos and the American Democrats seriously believe that any agreement guaranteeing neutrality and independence to the Philippines would be honestly adhered to by the signatory Powers? They have only to watch the unfolding of the greater drama being enacted on the mainland of Asia to disabuse their minds of such a hallucination. How many solemn agreements have been made and broken during the last fifteen years in the keen struggle for supremacy in the Far East, and now as the time draws nearer when the crisis is due, would any treaty guaranteeing the independence of the Philippines be respected? Can a feeble Filipino Republic,



Francis Burton Harrison, Governor-General of the Philippines.

bolstered up by temporary neutralization agreements hope to fare better than Korea, or China, at the hands of the strong armed nations of the world on conquest bent? Have solemn treaties and understandings availed to check the outward pressure of Japan or appease the insatiable land hunger of the Bear who walks like a man? Has the Hay doctrine of the Open Door been lived up to since the great Powers subscribed to its provisions out of courtesy and friendship to America? Did the Korean treaty with America prevent the absorption of that weak and tottering empire by Japan? Can any holy or solemn treaty influence the future of Mongolia or Manchuria, or bring Tibet again under the sway of Peking? Can any treaty compel Russia to withdraw her grasp on Northern Manchuria, or lessen the preponderance of Japan in the South? Will Germany relinquish her preferential rights in Shantung or France abandon her position in Yunnan and Kwangsi, or would Britain be willing to permit any other Power to dominate the Yangtsze Valley or Kwangtung? Treaties between the strong and the weak are only entered into to be broken at the convenience of the former, and any neutralization scheme guaranteeing the independence of the Philippines would not be worth the paper it was written on.

These are the cold hard facts, and the Filipinos who are clamouring loudest for immediate independence should pause and consider. The United States Government stands ready and willing to comply with its oft repeated assurances of its readiness to concede independence to the Islands as soon as a stable government can be established. The Americans are not seeking to shirk their responsibility or thwart the legitimate aspirations of the Filipinos; in fact the entire country would heave a sign of relief, if it could be relieved of its responsibility with dignity and honor.

Until the greater problem on the mainland is solved, the wise and truly patriotic Filipino should go slow, very slow, otherwise they will pass "de Guatamala a Guatapeor," from the frying pan into the fire. If the American government, influenced by the urgent appeal of the immediate "independistas," and the provisions of the Democratic National Platform, unduly hasten the day of independence, the Filipinos will observe it in years to come as the national day of mourning, the anniversary of their absorption by another race.

The final status of the Philippines and their relation to the rest of the Far East cannot be determined by America alone. The Islands are located within the great future cock pit of the Orient, and all the neutrality treaties and international guarantees in the world cannot protect or preserve their independence when some strong power determines that their possession is essential to its commercial, economical or strategical welfare. Only some first class fighting Power can successfully maintain its sovereignty over the Islands and bring peace and happiness to the natives.

Americans may possibly concede that the Filipinos have now arrived at that stage where they are able to stand alone, and a government can be organized of sufficient stability to permit the withdrawal of the American authorities and the American soldiers. It may be conceded that Filipino civilization and their ideals of a free life have been elevated to the plane of the American or European, that slavery and peonage do not exist, and that the oligarchy composed of the small and favored ruling class have only the best interests of the masses at heart; it may be accepted that the high-minded and patriotic Filipino politician is fully competent to handle the situation, in short, all those petty, trivial and querulous contentions of the Filipino statesmen may be granted by a long suffering and good natured American public, and the guaranteed, internationalized and neutralized Philippine Republic safely launched on the treacherous sea of Far Eastern politics.

But when the storm clouds gather on the northern horizon and the typhoon howls down the Formosa Channel, and the neutralized ship is caught in the vortex and threatened with certain destruction, is the American naval base to be turned into a life-saving station to rescue the inexperienced and feeble crew from the disaster their rash and hasty experiment has invited?

GOVERNOR GENERAL HARRISON'S POLICY SPEECH

Following is the text of Governor General Harrison's first speech in Manila, delivered on the occasion of his arrival on October 6:—

Citizens of the Philippine Islands:

The president of the United States has charged me to deliver to you the following message on behalf of the government of our country:

"We regard ourselves as trustees acting not for the advantage of the United States but for the benefit of the people of the Philippine Islands,

"Every step we take will be taken with a view to the ultimate independence of the islands and as a preparation for that independence, and we hope to move towards that end as rapidly as the safety and the permanent interests of the islands will permit. After each step taken experience will guide as to the next.

"The administration will take one step at once and will give to the native citizens of the Islands a majority in the appointive commission and thus in the upper as well as in the lower house of the legislature a majority representation will be secured to them.

"We do this in the confident hope and expectation that immediate proof will be given, in the action of the commission under the new arrangement, of the political capacity of those native citizens who have already come forward to represent and to lead their people in affairs."

This is the message I bear to you from the President of the United States. With his sentiment and with his policy I am in complete accord. Within the scope of my office as governor general I shall do my utmost to aid in the fulfillment of our promises, confident that we shall thereby hasten the coming of the day of your independence. For my own part I should not have accepted the responsibility of this great office merely for the honor and the power which it confers. My only motive in coming to you is to serve as well as in me lies, the people of the Philippine Islands. It is my greatest hope that I may become an instrument in the further spread of democratic government.

To every democrat, government rests only upon the consent of the governed and we do not maintain that self-government is the peculiar property of our nation, or that democratic institutions are the exclusive privilege of our race. On the other hand we do not believe that we can endow you with the capacity for self-government. That you must have acquired for yourselves. The opportunity of demonstrating it lies before you now in an ever-widening field.

As for ourselves, we confidently expect of you that dignity of bearing and that self-restraint which are the outward evidences of daily increasing national consciousness. In promising you on behalf of the administration immediate control of both branches of your legislature I remind you, however, that for the present we are responsible to the world for your welfare and for your progress. Until your independence is complete we shall demand of you unremitting recognition of our sovereignty.

You are now on trial before an international tribunal that is as wide as the world. We who appear before this august court in the light of your advocates are proud of the privilege that has fallen to us and we do not shun the responsibilities of our role which is without a parallel in history. We shall eagerly await convincing proof that you are capable of establishing a stable government of your own. Such a government may not necessarily denote an entire reproduction of our own institutions, but one which guarantees to its citizens complete security of life, of liberty, and of property. We now invite you to share with us responsibility for such a government here. Every Filipino may best serve his country who serves us in this endeavour; and to that end I call every good citizen of these islands and all who dwell therein, whether of native or foreign birth, for assistance and support.

People of the Philippine Islands! A new era is dawning! We place within your reach the instruments of your redemption. The door of opportunity stands open and, under divine providence the event is in your own hands.

GERMANY'S RIGHTS IN SHANTUNG

THE TSINGTAO-TSINANFU RAILWAY

Rumors that Germany is negotiating with the Chinese Government with regard to further railway construction in Shantung calls attention to the present status of Germany in the province which the world recognises as her sphere of influence.

Germany, by virtue of the Kiaochow Convention signed on March 6, 1898, was not only given a ninety-nine years' lease of the important port of Kiaochow, but was also conceded well defined railway and mining rights throughout the province. Two lines of railway were specifically mentioned: one from Kiaochow and Tsinan-fu to the boundary of Shantung province, via Weihsien, Tsinchow, Pushan, Tsechuen and Suiping; and the other from Kiaochow to Chinchow, with an extension to Tsinan-fu through Laiwu-hsien, though it was provided that the extension should not be begun until the first part of the line, the main line, had been completed, in order to give the Chinese the opportunity of connecting this railway in the most advantageous manner with their own system.

THE TSINGTAO-TSINANFU RAILWAY.—The Tsingtao Railway Station

In order to materialise this programme it was stipulated that a Sino-German Company should be formed, German and Chinese representatives of the Company to effect all arrangements in connection with the commencement and carrying out of the construction work. The Chinese Government was committed to afford every facility and protection and to extend every welcome to representatives of the German Railway Company operating in Chinese territory, and emphasis was laid upon the fact that the object of constructing these lines was solely the development of commerce. On her part Germany declared that in inaugurating a railway system in Shantung she "entertained no treacherous intention towards China, and undertook not to seize unlawfully any land in the province."

A similar undertaking was made with regard to mining, and the Chinese Government consequently permitted German subjects to hold and develop mining property for a distance of 30 li (about ten miles) from each side of these railways and along the whole extent of them. On the line from Kiaochow to Tsinan-fu the localities of Weihsien, Pa-shan-hsien and various other places were specified for mining purposes; Chinchow-fu, Luiwu-hsien, and other points being likewise mentioned in regard to the Kiaochow-Tsinan-Chinchow line.

German capitalists, by virtue of the Convention, also obtained the right of preference to find capital for any scheme for the development of Shantung by the Chinese Government or Chinese citizens, and German made materials were guaranteed a preference over all others. China could only approach other nationals for capital or material if German capitalists or manufacturers declined to take up the business, and herein lies the chief hold which Germany has upon the province of Shantung as a sphere for development under her sole direction.

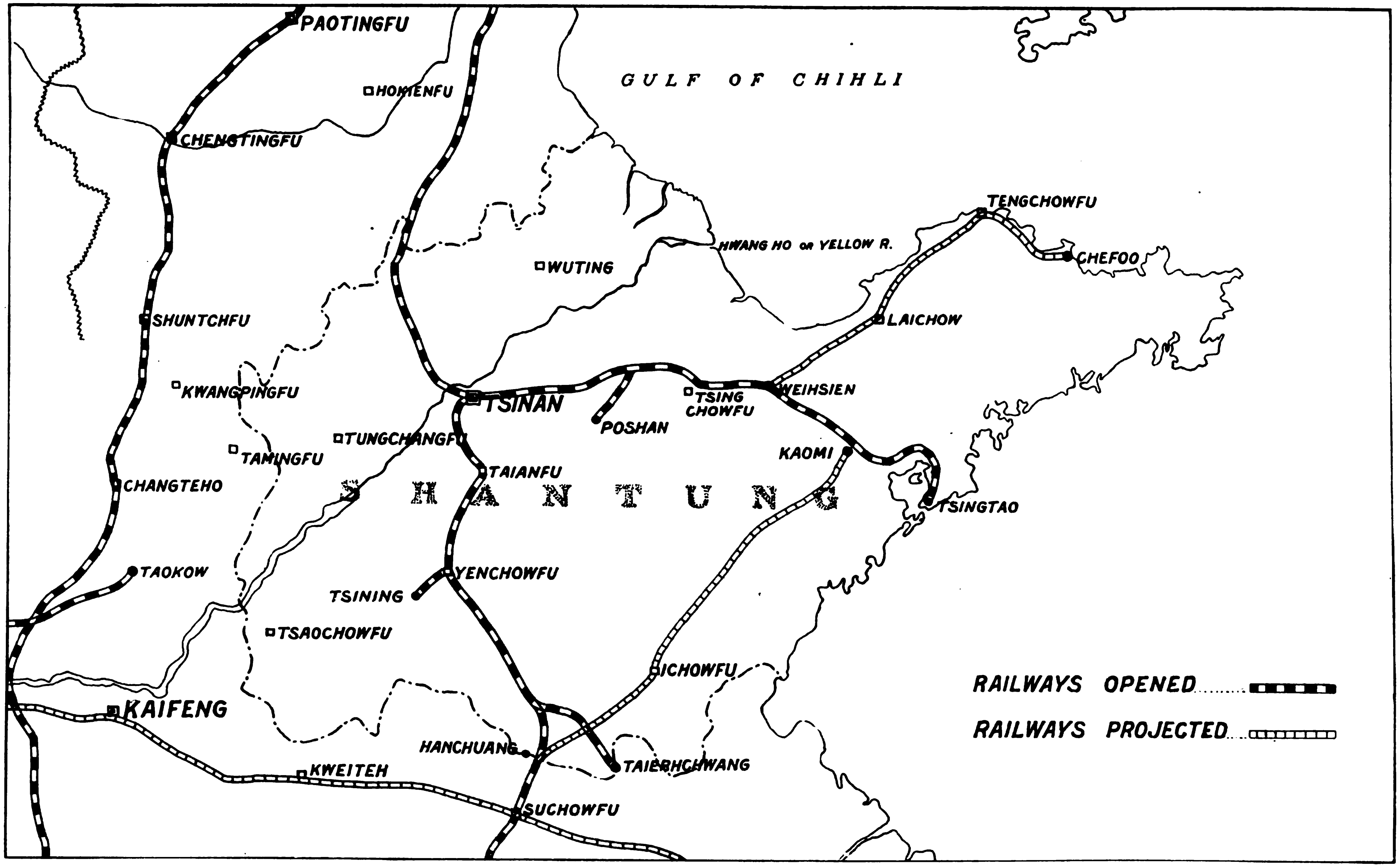
Other nations have acknowledged the paramount interests of Germany in Shantung, and practically speaking Germany has been free to use her own discretion in proceeding to develop the policy she originally decided upon to make the province productive and so establish the new port of Kiaochow upon a commercially paying basis. Wonders have been already worked on the small area of coast in Kiaochow Bay, and Tsingtao, the port which has been built there, is one of the finest on the China Coast. The harbor is a magnificent one, the facilities for shipping are up-to-date, and the city of Tsingtao stands pre-ëminent as a summer resort. The colony is one to which visitors gladly accord the highest honors as a residential centre. In that respect it is the foremost in China, and there is no telling that a similar precedence may not yet be gained by it commercially.

With the building of this port Germany also set about the development of the hinterland and the inauguration of adequate means of transportation and communication. With the Kiaochow Convention in hand she at first determined upon a triangular railway system connecting Tsingtao with the capital city of Tsinan-fu, but later on modified that scheme. The base of the triangle was to be a line running south-westwards to Ichow-fu; one side was to proceed from Ichow-fu to Tsinan-fu, which would be the apex, and the other side was to connect the capital and Tsingtao.

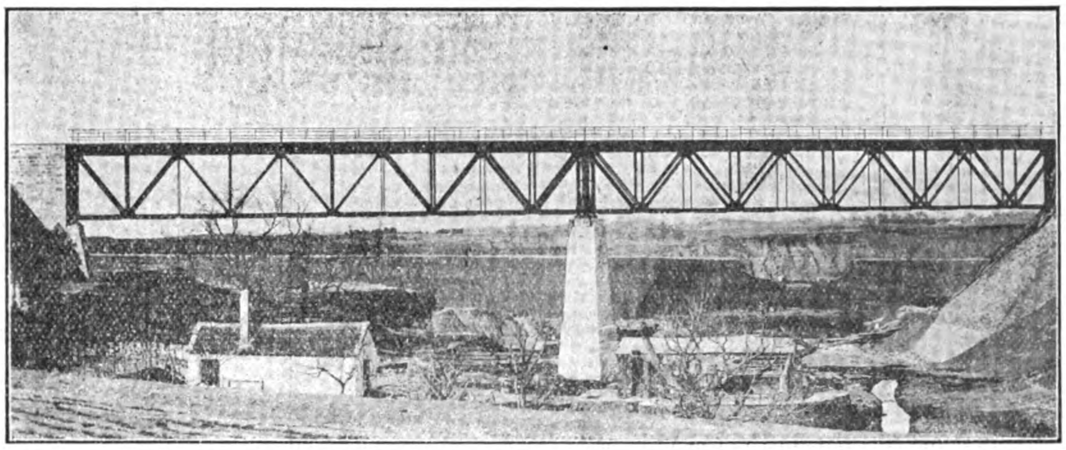
Of that system the line to Tsinan-fu direct from Tsingtao has been built by the Shantung Railway Company, an organisation with a capital of 54,000,000 marks, and connection has been made thence with Tientsin by a junction with the trunk line running from Pukow, on the Yangtsze River, to Tientsin, through Tsinan-fu. The line from Ichow-fu to Tsinan-fu has not been proceeded with owing to the construction of the Tientsin-Pukow line, which rendered it practically unnecessary, although no connection has as yet been made between Ichow-fu and this railway, and no arrangement has yet been come to with regard to the building of the line between Tsingtao and Ichow, although negotiations have been proceeding for some time.

In this connection the question develops of Germany possibly restoring in part the sovereign rights of China. The railway now in operation between Tsingtao and Tsinan-fu was constructed as a German railway by a German Company, with German and Chinese share capital, German equipment, and personnel so far as the high officers are concerned; and though the experiment has been decidedly successful, the German Government, for broad reasons of policy, may not repeat the experiment, although they are entitled to do so if they so desire.

Effect would seem to have been given in a measure to this intention in the construction of the northern section of the Tientsin-Pukow railway, the construction of which line practically paralleled the proposed Ichow-Tsinan-fu railway originally proposed as part of the system to be inaugurated under



RAILWAYS IN SHANTUNG.—Portion of the Belgian line from Lanchow to Haimenting is shown in the left hand lower portion of the map. The extension of the line from Tsinanfu to Shuntefu in Chihli has been talked about again recently, but is not shown in this map.



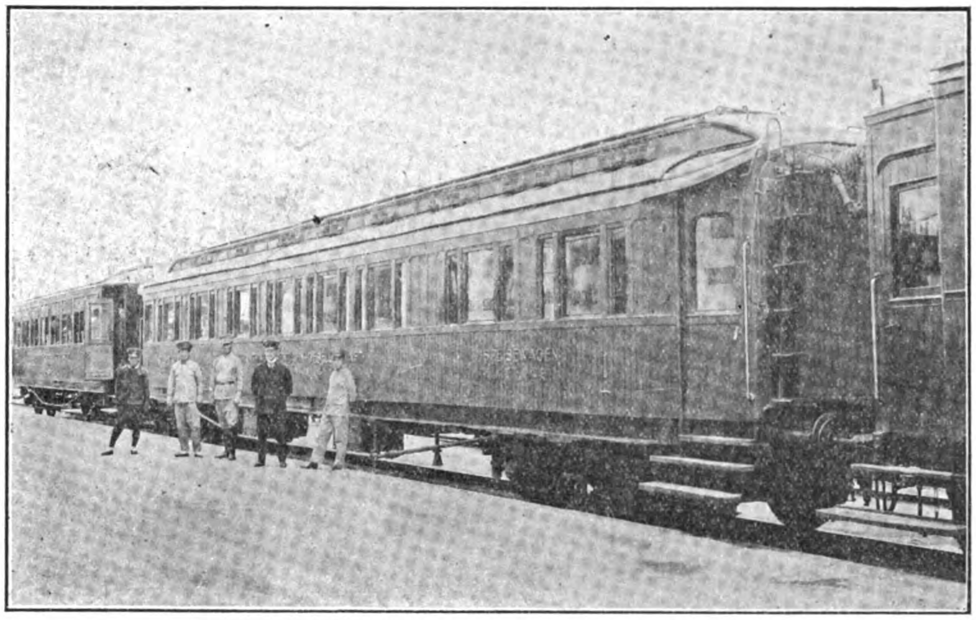
THE TSINGTAO-TSINANFU RAILWAY.—Bridge at Kilometre 316 ; length 80 metres

German Company management. And an extension of this idea may be made until all further lines in Shantung are built under German ægis for the Chinese Government or citizens.

Germany could claim that in following such a policy, she is restoring sovereign rights to China, and that she is abandoning distinct monopolies conferred upon her by the Kiao-chow Convention. Instead of the German policy being political it is purely economical, or at least that is the contention of Germany, and China is looked to for appreciation of the fact.

So far as the mining monopoly is concerned negotiations for an agreement commenced in 1911 between Germany and the Shantung Tutuh in connection with the restoration of rights held under the Convention, and if this is ratified mining will be free to the Chinese to develop except where mines have already been opened for operation by German Companies at Hungshan and Fangtze.

Such concessions to China would be undoubtedly important at this period when the rights recovery craze is at its height among the Chinese, and when the political ideas of the Powers interested in China are being subjected to a change which may not contribute to the satisfaction of those patriotic citizens of the Republic who have long agitated against too paternal an interest being taken in their affairs by outsiders. The one railway built by a German Company in Shantung will, however, remain the property of that Company, and its working has been so satisfactory that it is worthy of study by the Chinese who contemplate the inauguration of railway enterprises in other parts.

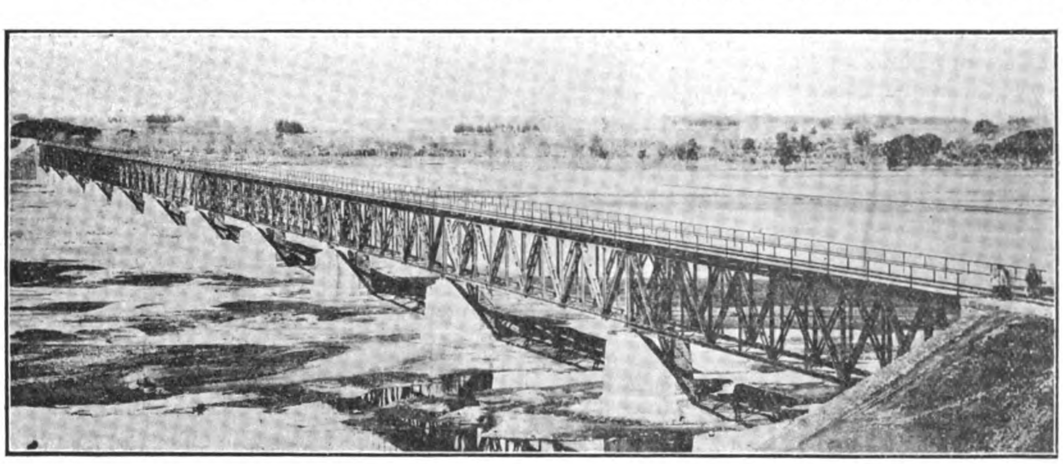


THE TSINGTAO-TSINANFU RAILWAY.—An Express Train

The report of the working of the Company for 1912 is published herewith, and shows an advance in profits over previous years. In 1911 the dividend paid was 6%, last year it reached 7½%.

Altogether 12,530 trains were run in 1912, and the passenger returns averaged 23,655 weekly, while the average of goods per week totalled 16,385 tons. The maximum number of passengers carried in one week was 35,469, while the maximum weekly cargo was 32,267 tons. In the year, 1,230,043 passengers and 852,001 tons of cargo were carried on the line, earning the gross income of $4,239,664; of this amount $970,246, or 22.89%, was from passengers; $3,229,969 or 76.18% from cargo, and $39,448, or 0.93%, from other sources. The average earnings per kilometre was $9,758.92. With this railway company has now been amalgamated the Shantung Mining Company, the compensation paid the latter being $5,400,000, which was raised by the issue of new shares. From April 1 to December 31, 1912, the net receipts from the Mining operations were $660,000, and for the first quarter of 1913, $240,000. Thus the value of the shares in the Railway Company has been visibly enhanced, and under the new management the expansion of the mining operations is likely to be rapid and consistent.

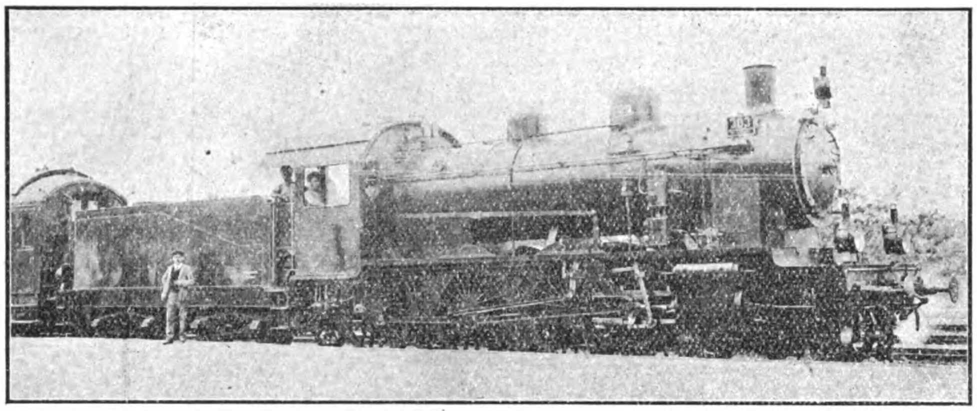
Much discussion has taken place recently with regard to a line from Chefoo to Weihsien, the Chinese evincing a great desire to have the railway built in order to secure the development of Chefoo as a port. At Weihsien a connection would be made with the Tsingtao-Tsinanfu line, and on its way to Chefoo the railway would pass through Laichow, touching the coast—if the old proposal is followed—at Tengchow-fu and following the sea south-eastwards to Chefoo. German capital is expected to be offered for this project, but the Chinese Government has not yet made up its mind to proceed with the work, though efforts are now being made to develop Chefoo harbor by the building of a breakwater. The railway is essential if Chefoo is to



THE TSINGTAO-TSINANFU RAILWAY.—Bridge at Kilometre 258 ; length 470 metres

become an important shipping centre, but it is doubtful if even that will make it anywhere nearly as important as Tsingtao, which port the Chinese hope to rival.

The proposed railway from Tsingtao to Ichow-fu, with a branch to the Tientsin-Pukow line, is also under negotiation. With this feeder Germany would hope to attract considerably more traffic to Tsingtao. Already great efforts are being made to capture freight at Tsinan-fu from the Tientsin-Pukow line for shipment at Tsingtao, and if that system could be tapped further south by a connection with Ichow-fu it is undoubted that Tsingtao would benefit considerably. Connection with the Lung-Tsing-U-Hai railway,* near Suchow-fu, would also be beneficial, and it appears that the Tsingtao authorities will aim at a junction with this important midland trunk line It is probable that a connection will also eventually be made between Tsinan-fu—or some other point of the line to Tientsin—and some point on the Peking- Hankow railway.



THE TSINGTAO-TSINANFU RAILWAY.—An Express Locomotive

That is the natural development of the system which must be carried out to make Tsingtao the thriving commercial port that Germany hopes to see it, and Germany naturally expects assistance from China in this direction if she foregoes the monopolies she now enjoys in Shantung, and which have been referred to above.

The Shantung Railway

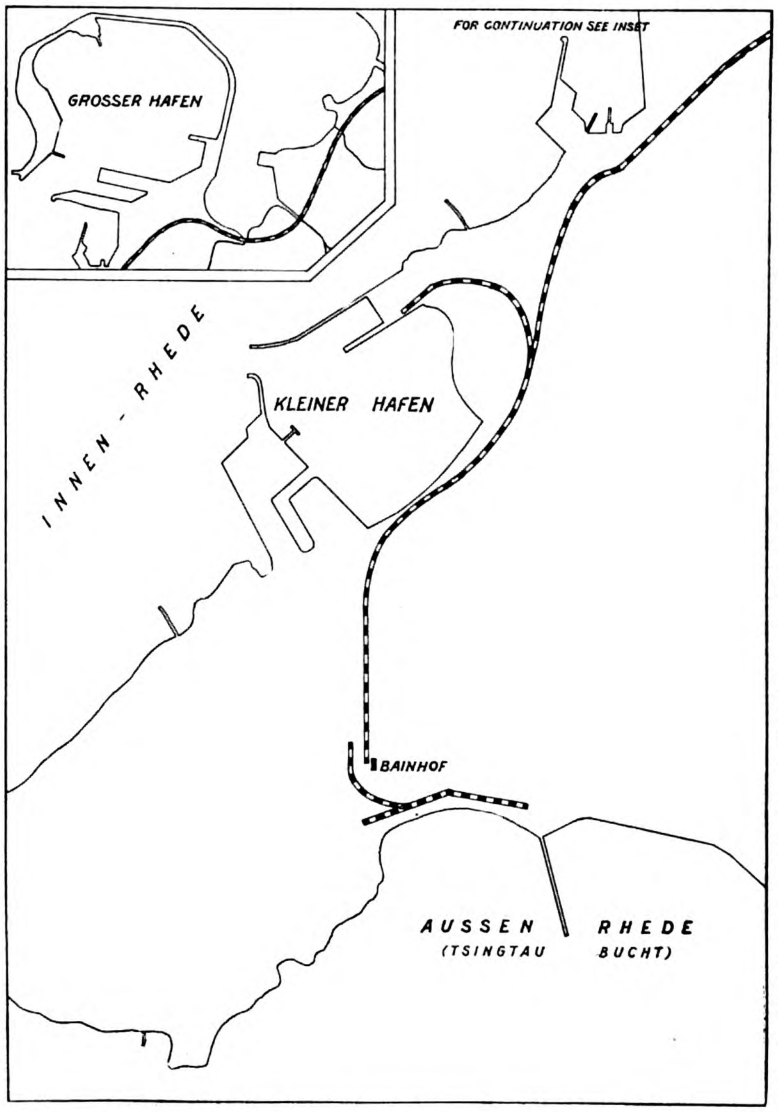
The railway from Tsingtao to Tsinan-fu has a length of 400 kilometres, giving direct connection with the Grossen Hafen (Big Harbor) and the Kleinen Hafen (Small Harbor) of Tsingtao. There are three branch lines, one between Changtien and Poshan 40 kilometres, one between Tsetchuan and Hungchan, seven kilometres, and one between Tsinan-fu and Haiau Ching-ho, three kilometres in length.

The main line leaves Tsingtao with a sweep around Kiaochow Bay, affording travellers a magnificent view of the coast and blue sea on the one side and the Lau Shan range of mountains on the other, and then strikes out westwards, by north, for Weihsien, continuing thence westwards for Tsinan-fu, the ancient commercial towns of Kiaochow, Tsingchow-fu, Chow-tsun being passed en route. Cultivated fields meet the eye in every direction.

Chow-tsun is famed as being the centre of the silk industry of Shantung, and the traveller has many opportunities of purchasing the best grades of silk at moderate prices. A few miles out from this city the steep hills which indicate the site of the "Imperial graves of Tseotien," where ancient sovereigns of the country lie buried, are to be seen.

Tsinan-fu, the terminus, and the junction with the Tientsin-Pukow line, stands about four miles from the south bank of the famous Yellow River, known as "China's Sorrow" on account of its wandering propensities. The city is one of the oldest and most interesting in China, having many features attractive to the tourist student of Chinese life. Its curio shops, carpet manufactories, and silk embroidery establishments constitute a particular feature. It is the seat of the Governor of the province, and contains a University and a military school. It is electrically lighted, and maintains a large police force.

The railway station of the Shantung line, and that of the Tientsin-Pukow railway, are opposite one another and thus convenience is afforded to tourists—making a journey to the famous sacred mountain of Tai-shan, and "the holy shrine of Confucius" at Kufu comparatively easy. The passenger from Tsingtao to Peking remains at Tsinan-fu for one night, but is able to find comfortable quarters at hotels.



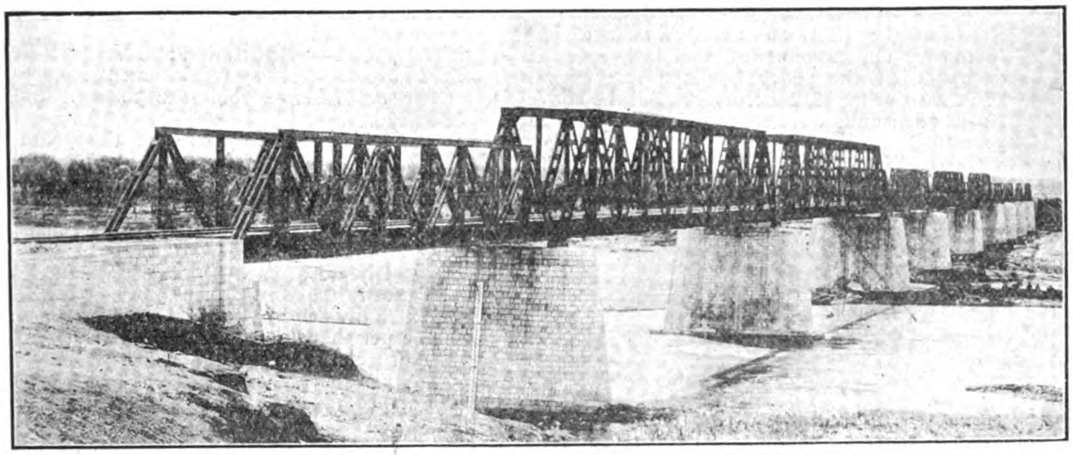
Plan of Tsingtao Bay, showing the Big Harbour (Grosser Hafen) and the Small Harbour (Kleiner Hafen). The railway, it will be remarked, has direct connections with the harbours.

The country traversed by the main line from Tsingtao is highly cultivated. Sportsmen who wish to linger by the way find opportunity for hunting hare, fox, pigeon, snipe, woodcock, wild duck, geese, swan and heron. In cold winters wolves emerge from the mountains near Tsing Chow-fu and Talintschyh and go in search of food to the neighboring villages, where the inhabitants tell of many a successful hunt of these rapacious animals.

The branch line from Changtien to Poshan leads in to the picturesque Poshan valley, where beautiful wooded ravines and defiles invite the stranger to make prolonged excursions. Poshan is a very busy town, the inhabitants devoting themselves largely to the manufacture of glass and porcelain.

In this valley, too, are situated coal mines belonging to the Shantung Railway and Mining Company. Iron mines also exist, and both products figure largely in the traffic returns of the railway. Incidentally it may be mentioned that the coal from the Hungchan mines is said to be equal to the best Cardiff.

*The Lung Tsing-U-Hai railway formed the subject of a descriptive and illustrated article in the FAR EASTERN REVIEW of April last.



THE TSINGTAO-TSINANFU RAILWAY.—Bridge at Kilometre 144 ; length 272 metres

The Tientsin-Pukow Railway and the Shantung Railway Company have come to an agreement for the issue of through tickets, which are on sale at the larger stations on both lines. Cargo and luggage are also transported from one line to the other without changing cars.

Shantung Railway Company

The following is the report of the Board of Directors of the Shantung Railway Company for 1912:—

The year 1912 closed with a profit of $3,063,909.13 (2,410,583.65)* and a dividend of 7½ (6%) for the capital and M. 12.50 (M. 5.00) for each special share. The receipts amounted to $4,239,664.01 (3,511,105.60) and the expenditure to $1,175,754.88 ($1,100,521.95). In spite of the decrease in the shipments of construction material for the Tientsin-Pukow Railway both the passenger and the freight traffic show a remarkable increase. The high rate of the Chinese dollar—mean rate for the year M. 210.47, (185.99)—benefited the financial result of the company to a great extent.

There were no remarkable accidents, neither were any bridges or culverts destroyed during the rainy season.

The increase in traffic and the connection with the Tientsin-Pukow Railway necessitated the following improvements and building:

At Hamatun and at Ershilipu one small freight-shed; in Tsinanfu West the enlargement of the station in order to facilitate the passenger and freight traffic from and to the Tientsin-Pukow Railway; in Tsingtau a dwelling house for Chinese station and train personnel, and a car shed for the new 1st Class dining cars; a depôt at Tsingtau Grosser Hafen; at Syfang enlargement of the shops (not finished), a shed for the main storehouse, and an office building for the administration of supplies with dwelling house for the personnel; a lumber-shed for the central repair, etc., shops at Kaumi; a lodging-house for training personnel in Fangtse and Weihsien; a lodging house for train-personnel in Fangtse; a dwelling house for Chinese personnel at Tchangtien and Tsinanfu West.

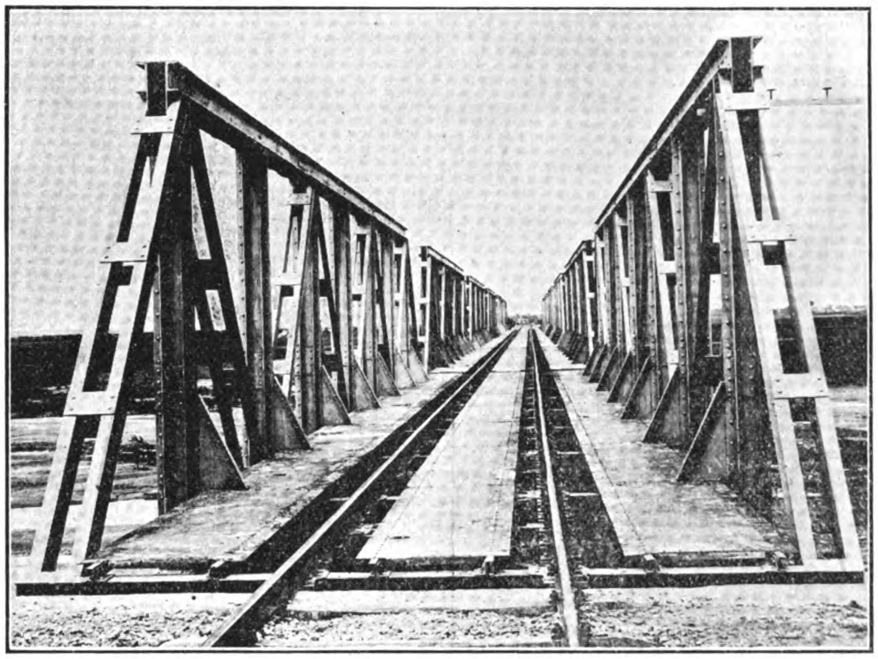
The condition of the tree plantations and shrubberies is satisfactory. Mostly acacia and willow were planted. The tree-nurseries of the Railway furnished the young trees.

The agreement with the Tientsin-Pukow Railway with regard to transfer of cars, which proved satisfactory, was in December, 1912, after the completion of the Hoangho-bridge, extended to all stations of the Tientsin-Pukow Railway. During the year 1912 the following cars were transferred:

From the Shantung Railway to the Tientsin-Pukow Railway, 3,959 (5,026) cars.

From the Tientsin-Pukow Railway to the Shantung Railway, 1,895 (492) cars.

The decrease of cars from the Shantung Railway to the Tientsin-Pukow Railway is due to the fact that the construction work of the Tientsin-Pukow Railway is nearing its completion and the shipment of supplies is decreasing accordingly.



THE TSINGTAO-TSINANFU RAILWAY.—Bridge at Kilometre 228 ; length 270 metres

Rolling Stock :—

Locomotives: 41 (41) viz:

23 ten wheeled, 6 coupled, 2 cyl. simple passenger engines.
4 ten wheeled, 4 coupled tank passenger engines
7 eight wheeled, 6 coupled tank-freight-train-engines
3 eight wheeled, 8 coupled 2 cyl. simple Freight-train-engines
4 eight wheeled, 6 coupled shunting engines

Total of 0.094 engine per kilometer of road.

Passenger and Baggage cars: 110 (100) viz:

15 Passenger cars, 1st and 2nd Class
5 ,, 2nd ,,
8 ,, 2nd and 3rd ,,
3 Dining cars
3 Kitchen cars
23 Baggage cars
10 ,, and mail cars.
1 Office car
1 Saloon car.

Total of 1.253 cars per kilometer of road.

Freight and service cars: 1,051 (1,013) :

283 Covered wagons
557 Coal (open) wagons
75 Coke-wagons
5 2-story cattle wagons
10 Wagons for transp. of lime with lid
104 Flat wagons
3 Trav.-cranes
2 Tool wagons
1 Trav.-scales

Total of 2.419 cars per kilometer of road.

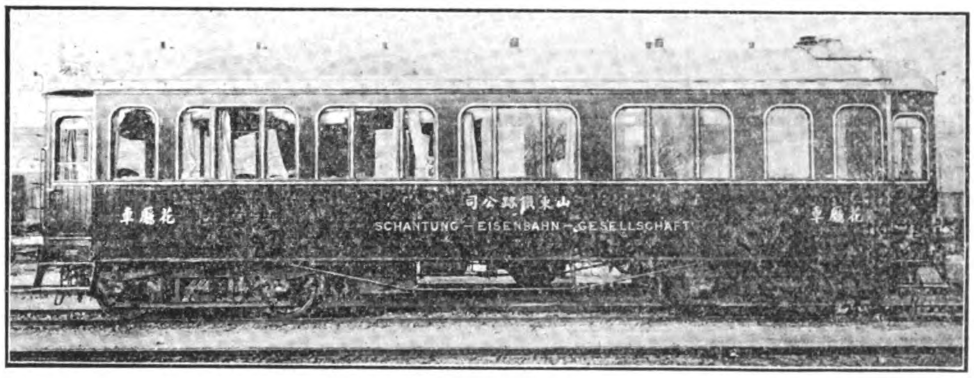
On the average there were 41 locomotives and 1,121.75 cars on hand during the year.

One express passenger train travelled daily between Tsingtau and Tsinanfu, also 16 mixed trains and about 9 Supply, etc., trains.

The total number of trains amounted to 12,530 (10,644) and the total number of kilometers travelled to 1,439,760 (1,322,805).

The number of kilometers travelled is distributed as follows:

	No. of trains.	Kilometer.
Passenger....	732 (688)	288,408 (269,490)
Special PassengerTrains	20 (9)	2,758 (1,646)
Mixed Trains	5856 (5,836)	653,680 (646,516)



THE TSINGTAO-TSINANFU RAILWAY.—A Saloon Car

*The figures in parenthesis are the corresponding figures for the preceding year.

	No. of trains.	Kilometer.
Trains carrying R. R. supplies ..	3,204 (2,049)	465,506(377,408)
Construction Trains....	2,718 (2,062)	29,408(27,745)

The rolling stock obtained the following results:

(a). Locomotives: 1,623,144 (1,432,374) Locomotive Kilometers distributed as follows:

		Loc. Kil.
in Passenger trains:	288,408 (269,490)	„
„ Special P. „	2,758 (1,646)	„
„ Mixed „	653,680 (646,516)	„
„ Supply „	465,506 (377,408)	„
„Construction „	29,408 (27,745)	„
„ Extra engines	153,019 (83,506)	„
Empty	30,365 (26,063)	„

in addition to the above

in Switching 42,606 (35,794) hours at 10 L. Km.=426,060 (357,940)

in Miscellaneous 20,370 (19,534) hours at 5 L. Km.=101,850 (97,670)

(b). Wagons: 61,807,064 (50,486,864) Wagon-Axle-kilometers, i.e.,

		Axle-Kilo.
Passenger cars	13,552,466 (10,315,180)	„
Baggage & Mail cars	3,446,100 (3,206,848)	„
Freight cars	44,808,498 (36,964,836)	„
Empty	15,433,076 (12,683,180)	„

Average strength of train:
42.93 (38.17) axles.

Average of traffic per week:
23,655 (17,482) Passengers
16,385 (14,081) Freight tons

Greatest traffic in one week:
35,469 (25,283) Passengers
32,267 (24,277) tons of freight

Total of traffic
1,230,043 (909,065) Passengers
852,001(717,189) tons of freight.

RECEIPTS: Total $4,239,664.01 (3,511,-105.60) distributed as follows:—

Passenger traffic: $970,246.52=22.89% (714,204.55=20.34%)

Freight traffic: $3,229,969.37=76.18% (2,741,807.86=78.09%)

Miscellaneous $39,448.12=0.93% (55,093.19 =1.57%)

Average receipts per km. $9,758.92(8,081.91)

Compared with the preceding year the receipts increased 20.75%(—5.88%) as follows:—

Passenger traffic + 35.85% (+9.04)

Freight traffic + 17.80% (—7.63)

Miscellaneous — 28.40% (—48.51)

EXPENDITURE: Total $1,-175,754.88 (1,100,521.95) = per kilometer $2,706.37 (2,533.20) compared with preceding year + 6.84%(+10.08)

The proportion of the receipts to the expenditure 100: 27.73 (31.34)

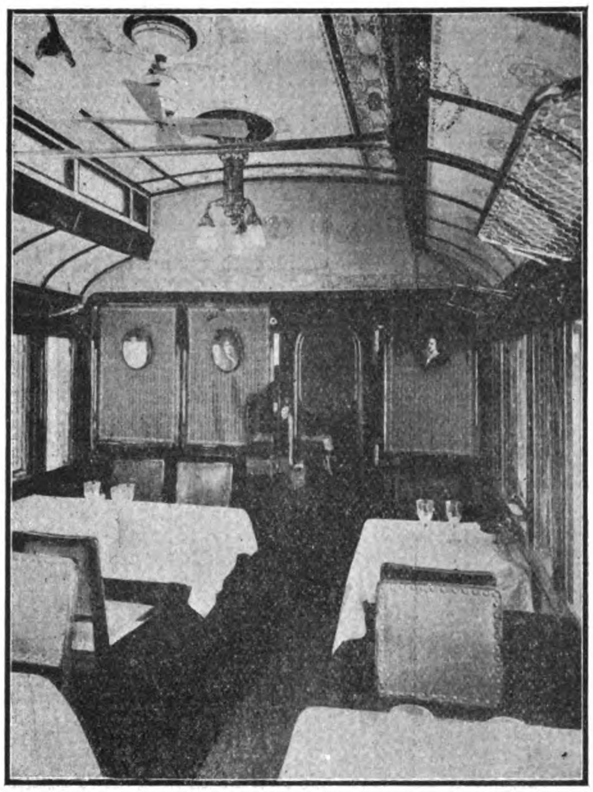
The following items concerning the balance have to be considered:—

Supplies on hand:

Main Storehouse	M. 884,393.36
Telegraph „	36,411.72
Coal & Oil „	79,635.48
Printing „	18,291.79
Fixtures, etc.,	9,500.91
Total	M. 1,028,233.26

Stocks and Bonds on hand: M. 520,000.00—3½% Bayerische Eisenbahnanleihe (Bavarian R. R. Loan) and M. 300,000.00 3½% Deutsche Reichsanleihe (German Loan) remained unchanged. On account of the low rate of exchange of the above bonds a loss of M. 26,540.00 during 1912 occurred. All the above stocks and bonds were sold during the current year 1913.

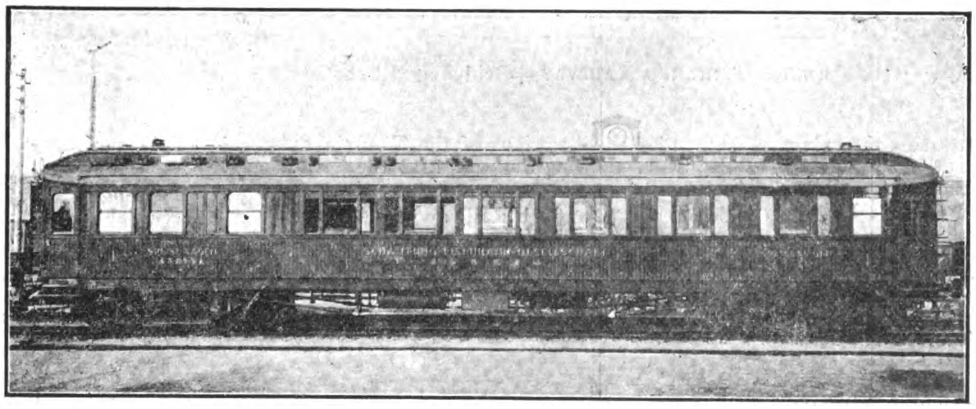
Outstanding Funds: Advances made to Shantung Mining Co. M. 1,000,000.00.



THE TSINGTAO-TSINANFU RAILWAY.—Interior of Dining Car

Repair and Improvement Fund stands with M. 3,397,289.11 against M. 499,583.95 of the preceding year. The additions were:—

For use of track and material	M. 405,000.00
Interest	115,908.21
Sale of old material	1,037.50
	521,945.71



THE TSINGTAO-TSINANFU RAILWAY —A Restaurant Car

The deductions were: Expenditure for track and supplies	22,361.76
	499,583.95

To a newly formed "Disposition and Valuta" Fund M. 800,000 were transmitted.

PROFIT AND LOSS

Including M. 304,791.48, balance brought forward from 1911, and after deduction of:

M. 405,000.00—Addition to Repair and Improvement Fund

M. 800,000.00—"Disposition and Valuta" Fund

M. 26,540.00—Loss by rate of exchange,

The ***net receipts*** for 1912 amount to M. 5,596,296.61.

It was proposed to distribute the profit as follows:

To the Reserve Fund	M. 264,575.25
„ „ Special Reserve Fund	264,575.25
5% Dividend=M. 50 per share	2,700,000.00
Compensation of Board of Directors	103,117.73
Taxes to the Government	116,235.46
Extra dividend of 2½=M. 25 per share	1,350,000.00
To special shares M. 12.50 per share	675,000.00
Balance to be carried forward	122,792 92
	M.5,596,296.61

The traffic in the last few months of the new year has been satisfactory, and it is believed that the decreased receipts due to the double Chinese New Year will be made good. It was suggested by persons interested in both the Railway and Mining operations, to acquire the entire Mining Company to become part of the Company. As the existence and extension of the Mining Company is of vital interest to the Railway as being a source of considerable shipments over the line, a resolution was adopted at a General Meeting of the Company on February 12, 1913, to take over the entire Shantung Mining Co. against a compensation of M. 5,400,000.00, to be covered by an issue of new shares equally entitled to dividends from January 1, 1913, excluding privileged rights of shareholders as to sale of products. The registration of the resolutions in the Register of Commerce at Tsingtau took place on April 4, 1913, after the consent of the Imperial Chancellor as to the transfer of the Shantung Mining Co. to the Shantung Railway Co. had been obtained. The Shantung Mining Co. (to be dissolved) announced in accordance with Par. 50, Civil Law, the dissolving of the Shantung Mining Co. as such and asked its creditors by circular to send in their claims.

According to reports on hand the net receipts of the Shantung Mining Co. from April 1 to December 31, 1912, amounted to M 660,000.00 and for the first quarter of to. current year to M. 240,000.00. According tethhese figures and the expectations of the General Meeting, the results to be obtained from the Shantung Mining Co. will equal those of the Shantung Railway Co. and yield about an even distribution of dividends.

See table on next page

THE SHIPYARD AT FOOCHOW

Minister Liu of the Navy proposed some time ago to place the Foochow Shipyard under the direct control of the Ministry of the Navy. He proposed that $200,000 as preliminary expenses for starting work and the monthly expenses of $30,000 be appropriated. His proposal has been approved at a Cabinet meeting, and this sum has been consequently included in the budget of the third year of the Republic. Minister Liu will take over the management of this shipyard. He is now in Fukien disbanding troops. The Cabinet has instructed the Minister of Finance to remit necessary funds to Foochow. Mr. Tsen Ching-lien, who has been appointed Director of the shipyard, has gone to Foochow with Minister Liu.—*Peking Daily News.*

Shantung Railway Company

Balance Sheet

BALANCE ON 31 DECEMBER, 1912.

		Mark	Pf.		Mark	Pf.
Construction Account ...	*M* 56,929,324,15			Assets	54,000,000	—
Addition	„ 1,192,664,—	58,031,968	15	Outstanding Coupon stock.	14,650	—
				Creditors	25,624	41
Tree	*M* 91,822,68			Repairs and Improvement funds	3,397,289	11
Nurseries and plantations	„ 13,503,27	105,325	95	Reserve funds	1,181,276	12
				Special Reserve funds ...	1,181,276	12
Supplies		1,028,233	26	Disposition a Valuta funds	800.000	—
Goods billed en route		507,870	—	Profit and Loss account ...	5,596,296	61
Stocks and Bonds		717,380	—			
Cash in hand:						
In Berlin	*M* 1,034,83					
In Tsingtau...	„ 30,383,79	31,418	62			
Debtors:						
In bank...	*M* 3,879,274,46					
Outstanding	„ 1,894,941,93	5,774,216	39			
		66,196,412	37		66,196,412	37

PROFIT AND LOSS ON 31 DECEMBER, 1912.

Debit.		Mark	Pf.	Credit.	Mark	Pf.
Expended in operation		2,464,629	99	Brought forward for 1911.	304,791	48
Addition to Repair and Improvement funds		405,000	—	Gross receipts and Interest	8,987,675	12
Disposition a Valuta funds		800,000	—			
Loss by exchange		26,540	—			
Net profit		5,596,296	61			
Distribution:						
Reserve funds	*M* 264,575,25					
Special Reserve funds ...	„ 264,575,25					
Dividend 5 per cent.	„ 2,700,000,—					
Directors' fees	„ 103,117,73					
Government Taxes	„ 116,235.46					
Extra dividend 2½%	„ 1,350.000,—					
Special shares	„ 675,000,—					
Carried forward	„ 122,792,92					
	M 5,596,296,61	9,292,466	60		9,292,466	60

Character of Traffic

LIST OF GOODS SHIPPED

	1912	1911	1906	1905
Coal and Coke ...	471,808	418,536	207,876	158,115
Piece Goods ...	57,477	47.505	8,952	25,353
Metal, Machinery ...	13,625	42,962	8,912	9,873
Beans ...	48,777	35,575	36,572	38,409
Coal oil ...	34,516	31,626	10,331	2,936
Wood and Woodware ...	20,167	20,412	15,153	14,515
Oil ...	17,182	20,973	5,005	4,127
Cotton, raw and fabrics ...	4.458	9,721	25,648	9,899
Paper ...	8,545	7,961	7,134	1,685
Earthenware ...	8.740	7,796	5,209	3,847
Straw matting, etc. ...	10,385	6,166	3,897	3,993
Vegetables ...	45,911	30,635	2,340	2,193
Lime ...	5,866	2,868	3,358	3,285
Sugar ...	7,566	2,738	4,388	—
Grain ...	6,419	2,213	1,477	995
Matches ...	6,747	2,155	4,246	1,125
Tobacco ...	3,051	2,019	686	708
Cash ...	707	1,293	724	2,425
Rock of all kinds ...	2,906	1,104	1,942	2,026
Cement ...	668	1,051	1,965	3,607
Indigo ...	1,489	1,004	1,092	783
Kauliang... ...	5,136	926	907	—
Glassware ...	549	852	—	630
Flowers, plants, etc. ...	1,263	721	—	—
Silk cocoons ...	963	631	605	354
Silk ...	990	503	162	101
Oilseed Cake ...	1,504	435	—	3,727
Mill products ...	45	240	451	740
Rice ...	15	160	3,053	3,712
Salt ...	4,598	60	—	—
Brooms ...	4,029	33	1,757	1,029

CHINESE GOVERNMENT'S EXPENDITURE

The Ministry of Finance has submitted a statement of administrative expenditure for August to the Loan Audit Office for examination. The grand total is $9,710,000 apportioned as follows:—

Ministry of Foreign Affairs . . .	300,000
„ Interior.	350,000
„ Finance.	2,150,000
„ War.	3,150.000
„ Navy	230,000
„ Justice.	100,000
„ Education.	220,000
„ Agriculture	60,000
„ Industry	50,000
„ Communications . . .	100,000
Extraordinary expenditure	3,000,000

The extraordinary expenditure is for Parliament, the Printing Bureau, the Peking University, and the Imperial Household Allowances.—*Peking Daily News.*

PHILIPPINE'S COAL TRADE

Mr. J. B. Suttor, Commercial Commissioner for New South Wales in the East, gives the following details of the formation of a Coal Consumers' Association in the Philippine Islands.

"The object of the formation of the association," Mr. Suttor explains, "which is composed at the present time of the Government of the Philippine Islands, Manila Electric Railroad and Light Company, Manila Railroad Company, and the Philippine Railway Company, was for the purposes of purchasing fuel in large quantities in the open market at a lower unit cost than it could be purchased by any of the individual members separately; to ensure constant and regular shipments of coal; to reduce handling charges, and to employ a manager and fuel expert, whose duties will not only be to recommend the purchase of certain kinds and quantities of coal, but also to advise the consumers thereof of the best methods whereby the highest efficiency in combustion can be obtained, and to supervise the inspection and analysis of such coals purchased, the distribution, stevedoring, etc.

"The association is open to any concern which desires to enter as a member on the same basis as the original parties to the agreement. At the present time the association contemplates the purchase of about 137,000 tons of coal as follow:—

Government of the Philippine Islands, 36,000 tons.

Manila Railroad Company, 35,000 tons.

Manila Electric R. R. and Light Company, 40,000 tons.

Philippine Railway Company, 10,000 tons.

Compania General de Tobacos de Filipinas, 16,000 tons.

"The association will be governed by a board of directors consisting of five members, two of them will be nominated by the Governor-General of the Philippine Islands, and three selected by the other members of the association. The five members in turn will elect a chairman who, in conjunction with the manager and fuel expert, will transact all business of the association.

"The organisation of the association is the result of the exhaustive investigations and report of Mr. E. Randolph Hix as coal expert for the Government. Through these investigations, which began in 1910, Mr. Hix acquired a knowledge of the far eastern coals, which was valuable to the association, and he has been appointed manager and fuel expert."

PETROLEUM IN THE PHILIPPINES

THE GEOLOGY AND PETROLEUM RESOURCES OF THE SOUTHERN PART OF BONDOC PENINSULA, TAYABAS PROVINCE, PHILIPPINE ISLANDS

The first representative of the Bureau of Science to visit the part of Bondoc Peninsula in which the presence of petroleum has been known since the first years of American occupation in the Philippines was George I. Adams. During August, 1909, Dr. Adams spent about one week on Bondoc Peninsula visiting the various petroleum seeps known at that time, and in obtaining authentic samples of the crude oil for chemical examination. The principal results of Dr. Adams' work were given to the public in a press bulletin immediately after his return to Manila. He collected a sample of the petroleum from a shallow well on the Bahay River drilled by the Tayabas Mutual Oil Company in 1906. This sample was analyzed by George F. Richmond, and his report was published in the Philippine Journal of Science, Sec. A (1910), *5*, No. I.

In June, 1910, Wallace E. Pratt visited Bondoc Peninsula while engaged with Dr. Adams in a general reconnaissance of southeastern Luzon. The Philippine Journal of Science, Sec. A (1911), *6*, No. 6, contains data obtained by this visit, together with an opinion by Dr. Adams on the petroleum possibilities of the Tayabas field.

In January, 1911, Frank T. Eddingfield and Mr. Pratt spent two weeks in the oil field. A report by Mr. Eddingfield was published in the Mineral Resources of the Philippine Islands for 1910 (1911), pages 64-68.

In 1912, Warren D. Smith, chief of the division of mines of the Bureau of Science, went to the United States on leave, with special authority from the late Dr. Paul C. Freer, who was Director of the Bureau of Science at that time, to visit and study the oil fields of the state of California that the information might be applied to the examination of the local field. Accordingly, Dr. Smith spent nearly a month during the summer of 1912 investigating the California petroleum fields. During the absence of Dr. Smith in the United States, some interested parties in Manila arranged for the examination of the field by a noted European geologist. It was decided to profit by his observations and experience as well as to help him as much as possible, and Mr. Pratt and Mr. F. A. Dalburg were added to the party. The party devoted a period of two and a half months (May 27 to August 11) to a detailed geologic and topographic study of the oil field.

In February and March, 1913, Dr. Smith spent three weeks on Bondoc Peninsula in company with Mr. Pratt, confirming and amplifying the results of the work already done in this region.

The report, to be published in The Philippine Journal of Science, Sec. A (1913), *8*, No. 5, is based upon the findings of the major period of field work in 1912, but draws freely upon all the other investigations and contains all the information at present available to the Bureau of Science. The following data from the report of Mr. Pratt and Dr. Smith will be interesting:

The existence of petroleum on Bondoc Peninsula is established by the presence of seeps of petroleum associated with inflammable gas at various places throughout the oil field.

The quality of petroleum which might be recovered by commercial exploitation of the field is undetermined and can be determined only through the drilling of a series of test wells.

All the petroleum encountered so far is similar in character and of a good quality. It is of low specific gravity and contains a large proportion of light oils which would make it of relatively high value as a commercial petroleum.

The seeps are in highly inclined strata which are probably in all cases part of the structure of anticlinal folds. From this association it is believed that the petroleum in this field has, in accordance with the general law of petroleum accumulation, tended to collect in the crests of anticlines.

The petroleum occurs, associated with certain horizons, in an extensive series of beds of sandstone and shale (Vigo shale) which is similar in character to the oil-bearing rocks of productive fields, notably those of Japan. The principal seeps are found in the upper part of this series in a zone designated as the Bacau stage, which is predominantly shale but which contains subordinate beds of sandstone. In its seepage, the petroleum is associated with the shale rather than the sandstone and may be observed in some cases to come directly from the shale. Beneath the surface where closed lenses of sandstone probably exist, the principal accumulation of petroleum would be expected in the more open, sandy zones. At the surface the light oil appears to have escaped readily from the coarse-grained beds and to have been retained only in the fine-grained shale.

The petroleum may have originated, in part at least, in the Bacau stage of the Vigo shale, where it is now found. Globigerina and other organic remains are found in the strata with which the oil is associated, the decomposition of which may have given rise to petroleum. There is a possibility, however, that the oil is not indigenous to the strata in which it now occurs, but has migrated from its source to another horizon. Beds which are concealed so that they cannot be examined at the surface and which, consequently, may be the source of the oil which is now associated with the Bacau stage of the Vigo shale, occur as follows: (1) members of the Vigo shale above the Bacau stage, concealed by the overlap of the Canguinsa sandstone which overlies the Vigo shale unconformable; (2) the basal portion of the Vigo shale which has not been uncovered by erosion; and (3) any sedimentary formations which may underlie the Vigo shale.

Drilling exploration should be conducted along lines which have been indicated and wells should be so located as to explore the Bacau stage of the Vigo shale thoroughly under favorable conditions of structure. The possible sources of petroleum outside the Bacau stage likewise warrant exploration.

The structure of Bondoc Peninsula includes a number of anticlinal folds, and the conditions along some of these anticlines are considered favorable for the accumulation and retention of the petroleum, whether it occurs in all or in any one of the horizons at which it is suspected. Areas considered favorable for prospecting by test wells have been outlined.

The character of the petroleum and the geologic conditions governing its occurrence are such as to justify the exploration of the most favorable parts of the field by drilling in the hope of encountering natural reservoirs which can be exploited commercially.

The following localities are considered most favorably as sites for the location of series of wells to explore the petroleum bearing rocks of Bondoc Peninsula. They are arranged as nearly as possible in the order of their suitability from a geological standpoint, locality No. 1 being preferable to locality No. 2, etc. However, owing to conditions discussed in the full report to be published in The Philippine Journal of Science, Sec. A (1913), *8*, No. 5, it is possible that oil may be encountered at any one of the sites, even though it be absent elsewhere. There are many places other than those listed which would be considered favorable in case exploration at any of the sites herein recommended is successful.

Locality No. 1—The Maglihi Anticline in the southeastern part of the peninsula, near Mt. Morabi. The structure here is favorable, in that an anticlinal fold is clearly indicated and the strata are intact above the highest oil horizon. The presence of oil in this fold is proved by the seep at Banco. The anticline is acute and the strata in the eastern limb are steeply inclined, affording conditions similar to those which prevail in certain productive fields in California. The number of test wells required will depend partly on the results of the actual drilling, but probably a series of at least three wells should be drilled along an east-west line, one in the crest of the anticline and one in either limb at a short distance from the crest. Water and wood are available in the vicinity, but the locality is relatively inaccessible. It is about 6 kilometers from the coast and is about 250 meters in elevation.

Locality No. 2.—The Maglihi Anticline in the valley of the Bahay River. The conditions here are similar to those at locality No. 1, although the structure is not clearly defined and may not be quite so favorable. Oil is present in seeps and has been obtained in moderate quantity in two shallow wells at Bahay. The locality should be tested in the same manner as locality No. 1. Bahay is comparatively accessible, the proposed general site being 4 to 5 kilometers from the coast at an elevation of 40 to 50 meters. An old roadway leads in from the beach along the Bahay River, which could be utilized. Wood and water are available.

Locality No. 3.—The Central Anticline in the vicinity of Balinsog or Bacau. The structure is favorable and the presence of oil is indicated by a seep at Bacau. The larger size of the Central Anticline affords the possibility of greater accumulations of oil than would be expected along the Maglihi Anticline. The wells should be located across the strike of the formations, one well on the crest of the anticline, and one on each limb, as at locality No. 1. This locality is very inaccessible, being at 9 kilometers distance from the coast, with intervening elevations of about 300 meters. Wood and water are available.

Locality No. 4.—Ayoni Anticline about 1,500 meters inland from the mouth of the Ayoni River on the west coast. The structure here, a gentle, well-defined, anticline, is more favorable probably than at any other place in the oil field. There are no oil seeps along the crest, but, as is explained in the above mentioned report, the absence of oil seeps is not necessarily an unfavorable circumstance, and may even be considered a favorable condition. Test wells should be located as is recommended for locality No. 1. Water is available and there is some wood. The site is at a low elevation (20 to 50 meters) and is readily accessible.

Locality No. 5.—The Malipa Anticline near Cabongahan. To explore this fold with a series of three wells, it would probably be advisable to locate one well on the crest and two along Malipa Creek on the southern limb at varying distances from the crest. The structure is fairly good, and there is a seep of gas with some oil on Malipa Creek. The site is fairly accessible through the valley of the Vigo River and wood and water are available.

Owing to the general similarity of formations, drillers experienced in California or Burma, or both countries, should be employed on the work.

It is recognized that it may prove desirable from data obtained in the course of exploration by drilling to modify these recommendations.

SHANGHAI-NANKING RAILWAY

The Management of the Shanghai-Nanking Railway has issued a booklet containing the bye-laws and conditions governing the transport of passengers and the transport and storage of animals and goods on the Railway.

The bye-laws appear to be most comprehensive and the booklet will undoubtedly be of great value to those who take advantage of the facilities for travel and the despatch of goods offered by the Shanghai-Nanking Railway.

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THE MONTH

For the residents of the Philippines the most important event of the month has been the arrival of Governor-General Harrison and his elucidation of the Democratic policy in regard to the independence of the Filipinos. This subject is dealt with exhaustively elsewhere.

The recognition of the Republic of China and the election of the President have induced hopes that the long awaited restoration of confidence in business and financial circles will now come. There are, perhaps, few signs at the moment of writing that anything in the nature of a boom may be anticipated in the immediate future. Trade reports state that conditions are improving but slowly. An interesting position has arisen in regard to the powers of the President. The Constitution Committee had largely followed the lines laid down in the provisional constitution, by which the President's powers were considerably restricted. The President has demanded that his powers should be materially increased and the development of this fully-expected difference between President and Parliament will be followed with interest. It is thought, however, that there is no ground for anxiety.

The announcement has been made on good authority that the difficulties between Russia and China in regard to Mongolia are approaching settlement. The conference at Simla in reference to Tibet is progressing, but there seems to be a great chasm between the proposals of China and those presented by the representative of the Dalai Lama.

Finance has as usual engaged considerable attention. There have been rumours of more small loans, and it is stated that the Austrian syndicate has taken up Chinese Treasury Bills of the face value of £2,000,000. Negotiations have been opened in regard to the currency loan and in reference to another £25,000,000 from the Five Power Group. It is reported that these negotiations bid fair to be successful. Some of the provinces are reported to have concluded minor loans.

In regard to railways there has been considerable activity. A loan for the Yuet-Han Railway Co. of $1,000,000 was obtained from the Hongkong and Shanghai Banking Corporation, and as a result of this transaction an agreement has been arrived at to connect the Kowloon-Canton line with the Yuet-Han line. Belgium is said to have obtained the Central Government's sanction to build a line from Posehting in Kwangsi to Yunnanfu. Negotiations in regard to the railways in Shantung are referred to in a special article, on the Shantung Railway. Russia is said to have asked for the right to construct a line connecting Tsitsihar and Taonanfu, and the *Ostasiatische Lloyd* on October 24th declared that it was sought to extend the line from Taonanfu to Jehol via Chengchintun. This demand, if it has really been made, brings about an interesting situation, as on October 5 China is said to have signed an agreement with Japan giving that country concessions for five lines, including one from either Taonanfu or Chengchintun to Jehol. An article in regard to these appears elsewhere. Parliament has passed the Sinyang-Pukow Railway Loan Agreement.

CHINA AND THE PANAMA EXPOSITION

It is regrettable to have to record that the Government of China have allowed politics to interfere so seriously with the arrangements being made to provide suitable exhibits for the Panama Canal, that the products and curiosities of China are not likely to receive the representation they deserve.

When the request came to the Government to participate in the great exposition it was gladly responded to, and Mr. Liu Kwei-yi, the then Minister for Commerce and Agriculture, under whose department the matter was placed, entered into the work of preparation with enthusiasm.

Mr. Chen Chi was appointed Commissioner on account of his previous experience as head of the Nanking Exposition, and the Cabinet fell in with the proposal of Minister Liu to provide three million Mexican dollars to defray the expenses connected with the collection and installation of the exhibit. Offices were taken, a staff was got together, and conferences ultimately evolved a scheme which would have secured China a representation at San Francisco second to none for utility, uniqueness, and attractiveness.

Then the impecuniosity of China caused Minister Liu Kwei-yi to fall. He was tempted to negotiate and sign a preliminary contract for a loan with a foreigner. His enemies questioned the validity of the agreement, challenged the right of the Minister to sign a preliminary agreement without reference to Parliament, declared the use of the seal of the Ministry to have been contrary to law, and generally raised such a hubbub in and out of Parliament that the Minister was compelled to go before Parliament to explain his connection with the matter. Unhappily he was unable to satisfy the hostile members, and the result was that he had to resign his office.

With his resignation came the undoing of all the schemes he had devised. His nominee to the Commissionership of the Panama Canal Exposition was challenged, and every possible influence was brought to bear upon President Yuan Shih-kai to effect his removal from the post, but in that the President has not so far acquiesced. In other respects the enemies of the ex-Minister made the position extremely warm for Mr. Chen Chi. The amount of money promised for the preparation of the exhibit was first cut

from three million Mexican dollars to two and a half millions. Later it was shorn to one million two hundred and thirty thousand, and ultimately it was reduced to but seven or eight hundred thousand dollars.

In addition to the attack on the money end of the scheme, obstruction has been placed in Mr. Chen Chi's way in other directions. He was hampered to such an extent indeed that he was unable to comply with the regulations of the Exposition that all exhibiting countries must commence operations on their selected sites at San Francisco before the end of this year, and consequently he has been compelled to request an extension of time. That no doubt will be granted by the Exposition Committee, but unless the Government sees to it that intrigue is stopped a start will not be made until it is too late, and what should have been a striking feature of the Exposition will turn out to be an indifferent display of hurriedly collected, second rate samples of China's products.

No beginning has yet been made upon the task of collecting exhibits, and for agricultural and kindred collections there will be a poor chance of getting together an adequate representation from the various provinces if this autumn is allowed to pass without something being done. Lack of communication, and the tremendous distances in China, compel longer time being given to this sort of work than is required in other countries, but that fact is not recognised by those who are sacrificing China for personal reasons.

With $3,000,000 an elaborate and handsome exhibit would have represented this youngest and largest Republic—but with $800,000 Mexican currency it will be difficult for the Commissioners appointed to make the show which China should make. It is to be hoped that reconsideration will be given this important matter, so that China will be able effectively to show the world what she really can do in the various spheres of human activity.

CHINA'S POSTAL SERVICE

As China's Postal Administration has to deal with a larger domestic area than any other country particular interest attaches to the development of this branch of her public services. The report on the working of the administration for the year 1912 has recently been issued, and it shows that steady and gratifying progress has been made. One of the features of the year was the enormous development of the newspaper business. This, of course, may be attributed directly to the revolution and, although all the publications which owe their birth to the overthrow of the Manchu dynasty cannot be commended for their moderation, the educative effect of the growth in number of organs of public opinion cannot fail to be beneficial.

Statistics are not as a rule enlivening, but the figures given in regard to the extension of the mileage are decidedly of interest. The courier lines were increased to about 108,300 miles; the native boat lines to 9,000 miles; the steamer lines to 9,700 miles and the railway lines to about 6,000. The bulk of the work is thus still done by the courier lines, but the mileage of the railways will increase rapidly in the immediate future.

In Shansi, the report states, communications with Honan were accelerated, and arrangements were made to facilitate access by various routes to Shensi and Kansu. Railway construction in the province remained practically at a standstill. Work on the Tungpu line was abandoned, and the Yütze-Pingyaohsien section, the first to be constructed, is now no more than a mere track 40 *li* long. Work was resumed in August on the Changsui Railway between Kalgan (Chihli) and Kweihwating, in the northwest of Shansi; but only 30 *li* have been added, and the terminus remains at Yangkow. In Shensi an unprecedented spell of dry weather enabled the courier routes to be largely extended, and nearly 3,000 *li* of new lines were added. The long courier line linking up Honanfu, Sianfu, Lanchowfu, and Tihwafu was extended to Aksu and Kashgar, and now forms one continuous connection, 11,000 *li* (3,677 miles) long, from the eastern railway base to the extreme western boundary of the Republic. The greater part of this line passes through the Sinkiang province (Singsinghsia to Kashgar, 6,290 *li*=2,097 miles), and the couriers have to traverse long stretches of desert; but in spite of the difficulties, communication was uninterrupted.

The establishment of a through railway service on the Tientsin-Pukow line vastly increased the work done at the Nanking Post Office. The authorities of the southern section of the line at Nanking placed six mail cars at the disposal of the Post Office, for the conveyance of mails to and from the North, and have also permitted the use of their steam-ferries across the Yangtze. Iron pillar-boxes were erected at the more important stations along the railway between Pukow and Likwoyi, and a temporary Office of exchange was established close to the Pukow Railway offices. Both on this line and the Shanghai-Nanking and Nanking City Railways the train mail escorts have been provided with distinguishing uniforms. The Nanking Head Office was altered and enlarged to allow of the large amount of mail matter consigned to it being promptly dealt with. Accommodation at the Chinkiang Sub-Head Office was also augmented by the use of offices in the adjoining building. In the two provinces of Anhwei and Kiangsu more than 20 Offices were given express letter facilities.

Significant of the tenacity with which institutions in China cling to existence, is a reference in the report to the fact that the native postal hongs or agencies still carry on operations. However, their activities are being greatly curtailed, and before very long this picturesque survival of the past may be expected to disappear. The agencies, however, did good work in their time.

WASTED OPPORTUNITIES

A thought-inspiring article in reference to the transport of Chinese tea to Russia recently appeared in the *Peking Daily News*. Our contemporary points out that every year some 20,000 tons of tea are sent to Mongolia and Russia by Hankow merchants. Portion of this tea is sent by river steamer to Shanghai and thence forwarded to Tientsin. At Tientsin it is transported to Mukden by the Peking-Mukden Railway. Steamers which run direct from Hankow to Vladivostok also convey a large quantity of this cargo. It is obvious that there is much unnecessary distance covered, and also that the cargo has to undergo considerable handling that could be dispensed with.

In view of the fact that there is an efficient train service running between Hankow and Peking, it would be supposed that this cargo would take advantage of the speediest route. In China, however, the obvious thing to do is not often done, and it is only now that attention is being directed to the possibilities of the Peking-Hankow Railway being utilised for the transport of cargo from Hankow to Mongolia and Russia. Perhaps this may be taken as an indication that under the *régime* of Mr. Chow, the new Minister of Communications, the railways will be made much more remunerative to the country. The difficulty seems to be the taxation that has to be paid to Honan and Chihli. There is a prospect that these iniquitous and useless interprovincial taxes will be abandoned in the near future, and that in China, as in other parts of the world, exports will follow the quickest and most advantageous route. Our Peking contemporary states that a trial agreement has been signed by the Ministry of Communications and the tea merchants at Hankow, and that very shortly a test will be made of the possibilities of the overland route.

That the traffic on the railways in China is capable of enormous development is clearly shown by the reports of the various railways in operation. On the Shanghai-Nanking Railway, for example, the goods traffic increased from $239,162.61 in 1911 to $387,758.85 in 1912. On the Shantung Railway, the receipts from goods traffic increased from $2,741,807.86 in 1911 to $3,229,969.37 in 1912. The experience of these two lines would be that of every line operating in China if a determined effort were made to build up the traffic. The railways of North China have also steadily

developed this, the most lucrative part of the railway's working, and there is no reason why every line now running in China should not substantially increase its earnings from the carriage of goods. Under the present Minister, it may be anticipated that the possibilities in this direction will be kept steadily in view.

MINING IN CHINA.

Great attention is being directed at the present time to the prospects in Yunnan, particularly in regard to the mining industry. Loans to the provincial Government for the development of mines are being negotiated in several quarters. The *Hongkong Daily Press* learns that the Yunnan Tin Trading Co. (which has an office in Hongkong) has arranged for a loan of one million dollars from the Mitsui Bussan Kaisha; one of the conditions being that the Mitsui Bussan Kaisha shall have a claim to 500 tons a year of the output of the Company's smelting works, which, it may be mentioned, were erected by the firm of Carlowitz & Co.

Our contemporary also understands that the loan negotiations in which Messrs. Carlowitz & Co. were recently interested in Yunnan have fallen through and states that there is a rumour that the Mitsui Bussan Kaisha has been approached by the Yunnan Government for a loan of five millions dollars for the purposes of mining developments. A British firm is also reported to be considering proposals for a loan of two million dollars.

That Yunnan is in a very backward condition, and that there are boundless possibilities in the Southern province is well-known. Commenting upon the reported loan negotiations, the *Hongkong Daily Press* points out that during the last few months both the Kochiu Tin Refinery and the provincial Government have been in treaty with Franco-Russian, British, German and Japanese lenders; mining rights in each case being the proposed *quid pro quo*. Yunnan would probably have developed her mining resources long ago had it not been for the fatuous policy pursued by the provincial Government. Instead of encouraging mining development, the Government seems to have done its best to tax it out of existence. This suggests that it might be unwise to permit the provincial Government to continue to control the industry. Over-centralization is, of course, to be avoided, but it would appear to be in the best interests of the Republic for the development of mineral resources throughout the country to be undertaken by the Central authorities on some definite system. As our readers know the revision of the existing mining laws is at present in progress, and it may be expected that the question of provincial or central control will be considered.

While it is certainly true that China wants foreign capital to develop her mining industry, she also wants expert foreign advice and assistance. It seems rather remarkable that advisers on pretty well every other activity have been appointed, but no intimation has been made that is recognised that the mining industry is peculiarly one in the control and development of which foreign expert advice would be invaluable.

GOLD DREDGING IN BURMA

It is now some eight years, says the *Rangoon Times* of September 24, since the Burma Gold Dredging Co. (1911), Ltd., started dredging operations in the bed of the Irrawaddy River above Myitkyina, with the small dredge Alexander which was wrecked a year afterwards. In 1905 the company started to build their present dredges; the first of these being the Shamrock; then followed the Thistle and the Rose—three machines with buckets of seven cubic feet capacity; during the year 1909 the Moa, a dredge of ten cubic feet bucket capacity, completed the equipment, with the Baby prospecting dredge added during the year 1910. This dredge has a bucket capacity of two cubic feet. Starting with the year ending 30th November, 1904, we find the dredge Alexander produced gold valued at Rs. 9,732; for the year ending 31st August, 1905, the Alexander produced 258 ounces and the Shamrock 130 ounces valued at Rs. 19,570 (the Alexander was wrecked during 1906) and we find the Shamrock and Thistle gave a return, valued at Rs. 1,93,860. During 1907 the Rose was added, and with the Shamrock and Thistle produced Rs. 1,67,783; during 1908 the Shamrock, Thistle, and Rose returned Rs. 4,08,113. The dredge Moa was then added to the number during 1909, and with the Shamrock, Thistle and Rose dredged for the year gold to the value of Rs. 4,90,953. In 1910 the 2-foot machine was added, and with the Shamrock, Thistle, Rose and Moa combined, gave a return of Rs. 3,46,275. The reconstruction of the new company then took place, and the financial year ending with the 31st August in former years, was altered to the 1st May; so that from the 31st August, 1910, to the 1st May, 1912, the five machines only produced gold to the value of Rs. 2,89,750. For the year ending 30th April, 1913, the five dredges produced Rs. 3,11,049. Thus we have a total for the years 1904 to 1913 of Rs. 22,37,128, or £149,142 recovered from the bed of the Irrawaddy River, and placed amongst the world's circulation.

The dredging is entirely confined to the bed of the Irrawaddy River, and there would appear to be no beach gravel of economic importance. The river has worn itself down into the hard basement rock, which stands up high on either bank of the river; it is exposed to view in the middle of the river itself in coralliform shape, and at other places with large cracks and pot holes worn deep down into it. It is between the channels of this basement rock, and along the gravel bars, reaches, and small islands where the dredges work and recover the gold. The gravel, where it is found accessible to the dredges, is said to be easy to dig, and free from large boulders and buried timber; but experience has shown that dredging work is both difficult and hazardous at many places over the stretch of the river that has been worked since starting. The concession covers about 120 miles on the run of the river from the forks at Nmai Kha downwards, and it is said that about 50 miles of it have been found well suited and payable to dredge; while the remaining portion, according to more recent reports, would appear to be too lean for economic working. Some few years back the men in charge of the dredges were paid a bonus on the recovery made, and from recent information this would appear to have resulted in working out the more accessible richer portions without paying sufficient attention to the system of operation in regard to future working, with the result that considerable trouble is now experienced in getting the machines on to the unworked portions of the best gravel through the tailing piles left by this folly.

It is interesting to note that the Colonial dredge men have now been replaced by those whom they have taught while carrying on the work, and that great numbers of the inhabitant in the neighbourhood—Shans and Kachins—now form a large body of skilled and capable workmen sufficient to justify the present management in dispensing with expert white labour. The new manager considers there is many years' work for all the machines on payable ground under the present conditions and that he will be able to turn the company into a dividend-paying concern. There is no doubt that the company has been very economically run. The gold recovery in the past shows that the gravel is poor. The working expenses show that a recovery of less than two pence per cubic yard pays all expenses and keeps the company going, and that anything over two pence per cubic yard would mean profit to the shareholders. In comparison, there are many dredges operating in New Zealand of similar type for about a penny per cubic yard and earning big dividends on a recovery of four pence per cubic yard.

Geologically, the extreme finely-divided particles of the gold recovered would suggest that the residual deposition which the dredges have been working on is the tail end of a richer gravel deposit further up the river. The deposition of this fine alluvial "flood gold" cannot be expected to any great extent in swiftly running rivers. The further residual gold travels from its original source the more finely divided it becomes, even to microscopical dimensions, and the greater its purity is found. The dredging work done up the river towards the forks where the river divides into two large branches, proves that the gold was coarser and more plentiful, while the prospecting work carried out below Myitkyina was said to prove the reverse. The absence of any beach gravel of economic importance along the banks of the river also proves that the gravel in the bed of the river with its gold contents is derived from a source further up the river. The operations of this company during the past eight years have shown beyond doubt that gold dredging in Burma can be carried out as cheaply as in any other country. It is stated in the report of the present management for the past year that considerable saving in the cost of operating has been made and that if extended for a complete year, it would have amounted to over Rs. 1,20,000 of profit. If the present operations can be successfully kept going on this basis it is possible that the company will soon be on the dividend list.

TIENTSIN SUCTION DREDGER

The Chung Hua, a sea-going suction dredger which has been built by Werf Gusto, Firm A. F Smulders, Schiedam (Holland) to the order of the Hai-Ho Conservancy Commission, Tientsin, for the dredging works at the Taku Bar, left for her destination under her own steam on August 26. The vessel is 116 feet long by 34 feet, 6in. beam, and is capable of sucking at a depth of 26 feet. She can discharge the spoil into barges, moored alongside, or force it ashore by means of a pipe line to a distance of 9,000 feet. The craft is equipped with two compound engines of 250 i.h.p., each for navigating purposes and with a compound engine of 500 i.h.p. for the two sand pumps, supplied with steam from two boilers.

THE CHEFOO BREAKWATER

M. Lidttede-jeude is to undertake the construction of the breakwater. The engineer-in-chief comes from Holland and will be assisted by an efficient staff of Europeans.

THE PRESIDENTIAL ELECTION

YUAN SHIH-KAI'S PRONOUNCEMENT OF POLICY

It is refreshing to observe through the haze of pessimism which has overhung China for the past two years a glimmer of hope of a distinctly better time for the country—a hope generated by the settlement of the Presidential question, and the prompt recognition of the Republic by the great Powers who have stolidly withheld that privilege until China could settle herself to the selection of a formal President and supply some evidence of ability to secure order in the interior. The latter has been provided to the satisfaction of the Powers by the suppression of the recent rebellion, and Yuan Shih-kai has been raised by the representatives of the people to the definite position of President.

The election took place on October 6,—members of the Senate and House of Representatives assembling in joint session for the purpose,—and after an exciting foodless sitting of twelve hours, during which three ballots were cast, Yuan Shih-kai was declared elected by 507 votes, against 179 for Li Yuan-hung.

The first ballot failed to elect Yuan Shih-kai, although he secured 471 votes, owing to the rule requiring a three-quarters majority. He was 99 short; the next candidate being Li Yuan-hung with 154, followed by Wu Ting-fang with 33, and twenty others with votes ranging from 16 for Tuan Chu-jui, the Minister of War, 13 for Sun Yat-sen, and 11 for Kang Yu-wei, down to one each for several lesser stars in the political firmament, whose names were entered on ballot papers without their knowledge or consent.

The second ballot, for a similar reason, was abortive, Yuan Shih-kai receiving 497 votes, Li Yuan-hung 162, Wu Ting-fang 24, Sun Yat-sen 11, and nineteen others one or two each.

On this voting Yuan Shih-kai lacked 62 votes to be elected and a third ballot was necessary, as provided by the regulations; the names of the two candidates securing the highest number of votes in the previous ballots were submitted to the voters, the candidate securing the majority to be declared President. Out of 703 votes cast Yuan Shih-kai secured 507, and Li Yuan-hung 179, the remainder being informal. Cheers greeted the announcement, and the tense strain which was existent throughout the day was manifested by the panic which ensued when an unannounced flashlight photograph was taken during the declaration of the final ballot.

A feature of the election was the presence of thousands of soldiers and self-appointed guardians of the public weal about the House of Representatives, where the election took place. They assembled, it was said, to prevent any members leaving the enclosure before the election was completed. This display of force caused considerable comment among foreign visitors, and alarmed members of Parliament not a little. The military may have been placed on duty with good intention, but the unfortunate rumour that the sword would be drawn if the voters had the temerity to elect any other candidate than Yuan Shih-kai to the Presidency, coupled with the aggressive refusal of the guards at the gates to permit any member to go out for food or have food brought into the enclosure, unstrung the collective nerve to such an extent that it was not surprising to see visitors and members wildly rushing for the door, clambering under the seats, jumping out of the windows, or losing their heads entirely when the flashlight suddenly illuminated the building. All, except those in the immediate vicinity of the photographer, imagained a bomb was about to bring the house down about their ears.

On the 7th, General Li Yuan-hung was elected Vice-President on the first ballot by 610 votes out of a total of 718; the sweeping majority being read out amidst cheers which lasted for minutes. Fourteen others were accorded votes ranging from twenty downwards.

The election of both Yuan Shih-kai and Li Yuan-hung to the high offices of State which they now hold was a foregone conclusion. The President by suppressing the rebellion consolidated his position so greatly that even his most violent opponents were compelled to bend the knee in realisation that no other candidate could succeed against him, and to their credit most of them cast their votes in his favor. The political parties which originally entertained dreams of elevating one of their own party wisely decided not to run a candidate, and practically all members of the opposition were free to vote as they liked. The large vote cast in an assemblage generally credited with containing a majority against Yuan Shih-kai thus eloquently testifies to two things: the high standing now occupied by the President, and the significant change in the view of opponents dictated by the wisdom of placing the good of the country before the ambitions of the political party. In these two developments optimists find great hope for an era of order and progress to supersede the chaos and retrogression of the past two years. Whether materialisation will come rapidly or not depends largely upon the class of men employed by the President to assist him in the work of regeneration which he promises the country he will proceed to begin, and if his speech at his inauguration on the 10th instant (the anniversary of the outbreak of the revolution which brought about the overthrow of the Manchus) can be taken as a criterion President Yuan Shih-kai has made up his mind to show to the world that his country is deserving of the high opinions that its well-wishers have always entertained regarding it.

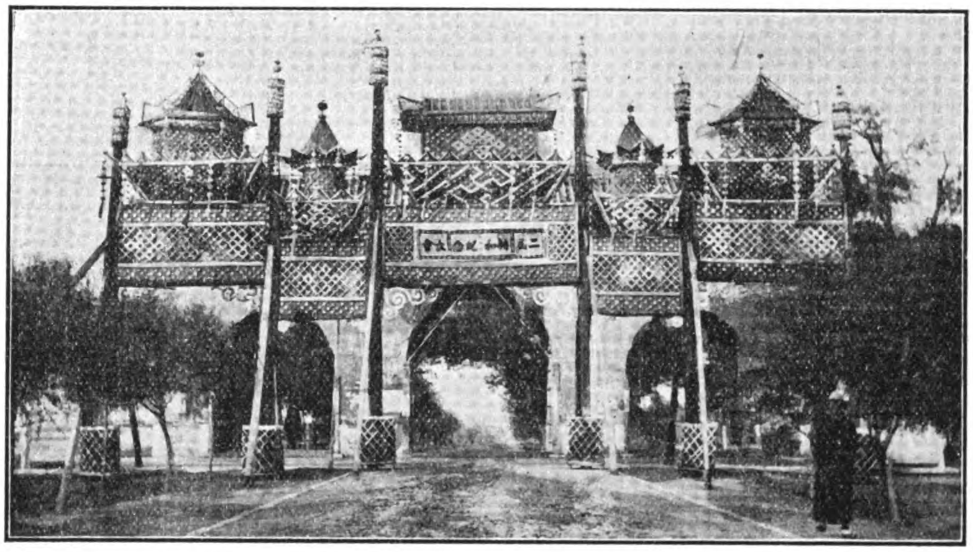
The inauguration was held in the Forbidden City in the presence of various sections of Chinese society, the Foreign Ministers, and representatives of Foreign society in Peking, and despite the rainy weather which prevailed, was an imposing function, as was the review of troops which took place afterwards at the south gate of the Forbidden City.

The President, with sturdy solemnity, took his oath of allegiance to the Republic, and then read an address which is worthy of reproduction since it embodies points which everyone interested in the economic development of China will be pleased to read. After perusing what is set down as the policy of the President the chief hope of all will be that His Excellency will find himself able to give effect to it. That is his most difficult task. He is beset with a multitude of obstructions, and not the least is the difficulty of finding men with capacity enough to grasp the needs of the time both from a Chinese and a modern point of view. There are officials who know the old fashioned methods and officials who understand requirements from a European standpoint, but very few who combine a knowledge of both, plus the courage of conviction. If Yuan Shih-kai can but half overcome this difficulty the country will profit exceedingly and rapidly, and the hopes embodied in the following speech may all fructify and live to the lasting benefit of the universe.

"Ever since my entry into the political arena," said the President, "I have been guided by safe and cautious principles. The fundamental basis upon which a nation is built is law and order. With law and order conserved, a nation can adapt itself to the progress of the world. During my past year's administration, though I missed no opportunity to carry out reforms and measures of enlightment, it has always been my principle that changes should be brought about by gradual degrees. It would be a political crime to gamble and experiment with the nation and the people and wipe out clean our ethics and traditions of the past four thousand years.

"After 1908 I retired, and all my partriotic ambition evaporated like a passing cloud. With the Wuchang outbreak I was compelled by circumstances

to bear once again the responsibilities of State. Disruption of the nation and suffering of the people were then my constant fears. However, the Ching Emperor abdicated and the Republic was inaugurated. I was elected to the Provisional Presidency. Though the Republican form of Government is not unknown to Chinese history all the circumstances tended to add difficulties to the administration. Progress was impossible, but I persevered and persevered in the hope that law and order might be brought into existence out of the then prevailing chaos. Unfortunately a minority of the disturbers of the peace raised the standard of rebellion, and the new born Republic of Eastern Asia was once again plunged into a state of turmoil. In order to save the Republic and to relieve the people I was compelled to suppress the insurrection with military force. Within the short period of two months the rebellion was stamped out, because the people are peace-loving and the soldiers are gallant and loyal. Now that peace again reigns, it is my sincere desire to retire from public life and enjoy the blessing of being a citizen of the Republic. But the People's Convention again elected me to the Presidency and the friendly nations have also expressed their desire to recognise the Republic when I am elected. In the face of these facts I am compelled to sacrifice my private desire for the sake of the nation so that the foundation of the Republic may not be again shaken, and the wishes of our fellow-citizens disappointed. I now assume office, and my one duty is the care of the nation and the people. This duty will not be tempered by considerations of personal success or failure, reputation or heaviness of responsibilities. I take this auspicious opportunity to express my opinions to the people.



One of the Arches erected in Peking in connection with the Inauguration of the President

Photo by Le Munyon

"It is the saying of the Western philosophers that a constitutional country is a country governed by law, and a constitutional Republic depends on the high moral and ethical standard of its citizens. In a republican form of government laws are made by the majority for the observance of all, and liberty without the bound of law is considered as license. The tradition of abiding by the law is a matter of gradual process. Though the Chinese are docile they are not yet imbued with these traditions. I hope that they will soon adapt themselves to the new condition thus further raising their ethical standard.

"The policy of a Republic is decided by the majority. The majority of our people wish to live in peace. But ever since the first revolution the people have been stimulated by the sentimental outcry of the minority. In spite of the fact that it has always been my sincere desire to preserve peace and restore the vitality of the nation the people suffered. This is a great misfortune. I will now do all I can to promote the welfare of our people and to secure the greatest happiness for the greatest number.

"The economic condition of the country is now very low, and the masses are struggling under very trying conditions. The bad elements of the country make use of the opportunities to serve their own end by driving to disturbance the people who are on the verge of starvation. In order to secure permanent peace it is therefore necessary to promote the economic well-being of the individuals, and to attain this object, agriculture, industry and commerce must be encouraged. In countries where a very high standard of civilization has been reached it is the ambition of all able men to join industrial and commercial life. Our natural wealth is abundant, but we do not study the science of production. Wealth is still hidden, and we have little to offer to the world for exchange. I hope therefore that the energies of our people will be turned in this direction in order to promote our economic well-being.

"However, there are two reasons why the industry of the country has not been developed. 1. The education of the country is still it its infant stage. 2. There is no large capital. Every branch of industry is in close relation to science. No attention has been directed to physics, or chemistry, steam or electricity. While others are engaged in the struggle for education, or the war of commerce, we are still cleaving conservatively to the old system, and have a superstitious faith in empty talk. I hope that the citizens of the country will introduce among them the enlightened education of foreign countries. Even in the departments of politics and laws the practical and not the theoretical part alone must be emphasized. This is my opinion with regard to education.

"Unless there is large capital it is no use to talk of industry. In view of the fertility of our soil and the richness of our produce, how can we call this country poor? The necessaries of life are but those things which are connected with clothes, food and dwelling, and silver and gold are a medium of exchange for the above. If there be a shortage of silver and gold the means of exchange will be lacking, thus without money we shall be without the medium of exchange. Therefore to prepare a start for the various industrial enterprises attention should be directed to the neighbours who are rich and possess ample stocks of the medium of exchange. When the natural resources are opened, and there are no waste lands and idle people, there will be a surplus after the repayment of the loan out of the gain made from the capital. Would not this be better than the man who buries his treasures and yet is worrying about his poverty? Therefore I hope that my country will introduce foreign capital in order to develop the industry of this country.

"To introduce the civilization and capital of foreign countries is not only for the good of the country but it is for the good of the world at large. The principle of the civilization of the world is to supply the deficiency of others by our own surplus, giving joy and happiness to society; hence in this matter there should be no distinction between countries. This is why Confucius liked to talk of universalization. Now our country has become a Republic, and consequently all the old thoughts belonging to the period of seclusion should be swept away. All our citizens who have observed the laws fixed by our own country, should also understand the common law of nations in the universe. In the intercourse with other countries everything should be done in accordance with the light of civilization, and we should never have any prejudice towards foreigners, causing trouble and breaking the law of justice.

"The attitude of the Foreign Powers towards us has always been that of peace and fairness, giving us cordial assistance whenever occasion arose. This was of course due to the civilization of

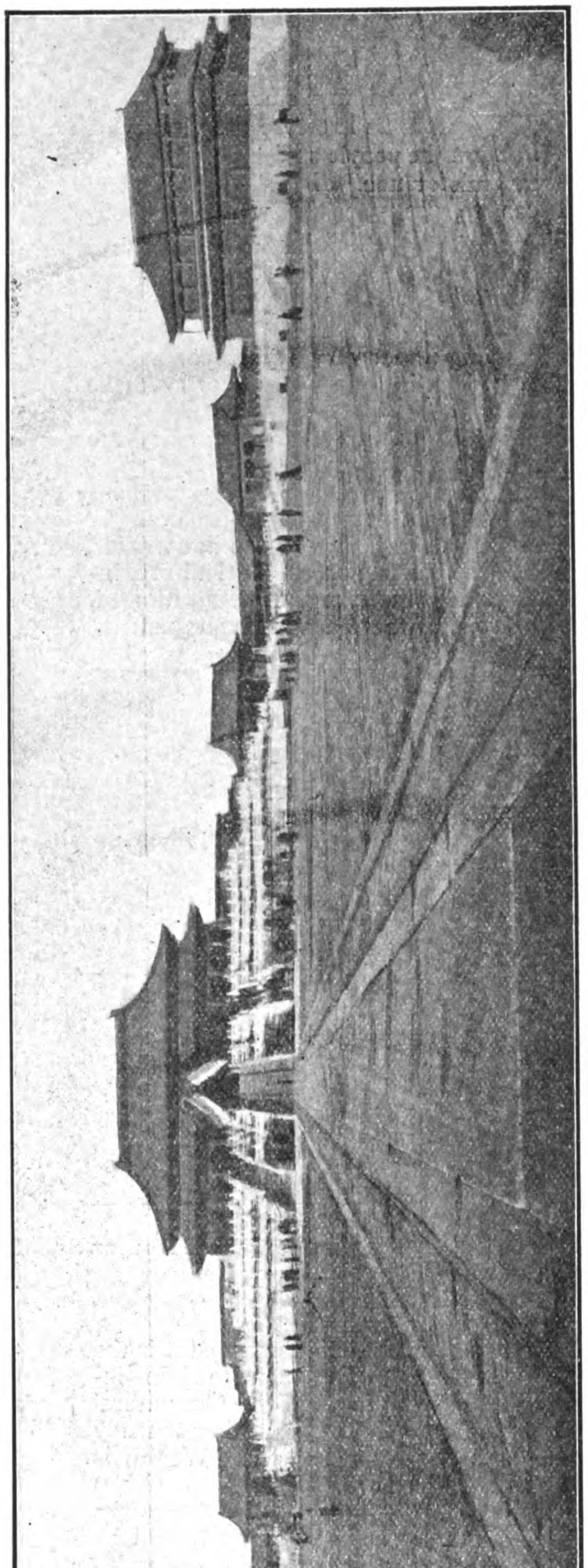
the world, yet all the same we highly appreciate the goodwil! of the friendly Powers. It is most important that all citizens of the Republic shall clearly understand this and endeavour to strengthen the international friendship with sincerity. I hereby declare that all treaties, conventions and other engagements entered into by the former Manchu and the Provisional Republican Governments with foreign Governments shall be strictly observed, and that all contracts duly concluded by the former Governments with foreign companies and individuals shali also be strictly observed, and further that all rights, privileges and immunities enjoyed by foreigners in China by virtue of international engagements, national enactments and established usages are hereby confirmed. This declaration I make with a view to maintaining international amity and peace.

"The above are what I wish to impress upon our citizens. There are yet other matters which I want to inculcate, namely morality and ethics. To put it briefly they consist of the four qualities:—Chung (loyalty), Hsin (faith), Tuh (diligence) and Ching (respect and consistency.) Chung loyalty does not mean obedience to one man. It means the love of one's country. It means the sacrifice of smaller interests to greater interests. It inculcates that duty for the nation should come before the interest of the persons. Confucius said that without Hsin a nation cannot stand. It is the essence of human society. Bad faith is now considered by the world as the greatest shame. Persons like Washington and Tseng Kuo-fang achieved greatness by the word faith. In the countries where high civilization is attained, in spite of progress, traditions and things of national importance are not discarded easily. Our civilization dates back for thousands of years and much of it is good. Doctrinaires of an extreme school are bent on wiping it out altogether. They indulge in high talk and accomplish nothing. Without getting any benefit from the teaching of the Western civilization they are already discarding what is really good in ourselves. Our people can only be rescued from degeneration by practising the quality "tuh." Consistency is another quality of great importance to our country at this juncture. Consistency breeds industrial habit, it prevents idleness and is a guarantee of peace.

"My greatest hope is that the people will be with me to practice these four qualities. Belief is now also prevailing that countries of high civilization are extravagant. The standard of living in foreign countres may be much higher, but it would be a great mistake to think that we can only progress by being extravagant. Signs are not wanting that extravagance has done much harm to China in recent years and the quality of thrift should also be practiced.

"Law and ethics should go hand in hand, the one helps the other, and the solidity of our country depends on this. At this juncture China needs recuperation, and it is not time for us to make any military display. The good discipline of the men of the Army and Navy is a matter near to my heart.

"I deliver the above with the greatest sincerity. I will use all my energy while in office to promote the well-being of the nation and carry heavy responsibility for the four hundred millions. That the four hundred millions will work with one heart is my sincerest desire."



The Tai Ho-tien Hall, where the Inauguration of Yuan Shih-kai took place

Photo by Le Munyon, Peking

COTTON SPINNING IN JAPAN

According to investigations made by the Japan Cotton Spinners Association, says the *Japan Chronicle*, the total number of spindles at the end of the first half of this year of 44 spinning companies in Japan, excluding those now in course of erection, was 2,239,532 ring and 49,360 mule, in addition to 309,672 for doubling, and 23,783 looms, compared with the end of the preceding ha.f-year, the number of ring spindles shows an increase of 114,552, doubling spindles of 348, and looms of 1,885, but there is a decrease of 2,388 in the number of mule spindles. The total capital and reserve funds of the 44 spinning companies at the end of the first half of this year compares as follows with the figures at the end of the preceding half-year:—

	Capital. Yen.	Amount Paid-up. Yen.	Reserve. Yen.
Second half, 1912.........	105,136,400	72,366,495	25,536,314
First half, 1913.........	115,466,400	82,482,909	31,217,859

The *Osaka Mainichi* notes that the amalgamation of the Tokyo and Kanegafuchi Spinning Companies, and of the Nisshin and Amagasaki Spinning Companies, which has been frequently spoken of, has not been effected. Both the Tokyo and Nisshin Spinning Companies, continues the Osaka journal, are in an unenviable position; their business not having been satisfactory for some years past. The paid-up capital of the Nisshin Spinning Company is Y. 3,499,125, while the reserve fund is not more than Y. 37,215, and the capital invested in machinery, buildings, etc., amounts to Y.3,921,292, against which not a sen has been set aside for some years, the company being barely able to continue payment of a dividend. During the past two or three years the dividend has varied between 5 and 7 per cent. No dividend was paid for the second half of 1910 and the first half of 1911. For the first half of this year a dividend was paid at the rate of 8 per cent. per annum, owing to the good yarn market last year, but this rate is nothing compared with the large dividends paid by other spinning companies. The paid-up capital of the Tokyo Spinning Company is Y.2,741,850, with a reserve amounting to Y.16,768. The proportion of the two items is even less favourable than in the case of the Nisshin Spinning Company, but the Tokyo company has been setting aside every period a sum of about Y. 20,000 for depreciation of plant and buildings (in which Y. 4,500,737 is invested), with the exception of 1910 and the second half of 1911. For the first half of this year the company set aside Y. 80,000, and it has maintained its dividend at between 5 and 10 per cent. In these respects the company is better than the Nisshin. It is, however, indisputable that the Tokyo Spinning Company is much behind other companies, who are now enjoying a prosperous time. The new spindles resulting from the formation of new spinning companies and the extension of old companies will come into operation next year. American raw cotton is advancing in price, as the result of the unsatisfactory crop this year, and the difficulty of buying raw cotton and the overproduction of yarn from the increased spindles may strike a heavy blow at all but first class spinning companies. The spinning companies in the Kwanto district, with the exception of the Fuji and Mie companies, are not doing much business, and it is generally believed that in the near future the spinning industry will be concentrated in the Kwansai district.

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THE RAILWAYS OF CHINA

REPORT OF CONDITIONS IN 1912

A statement of the standing of the various government railways under the control of the Ministry of Communications during 1912, the first year of the Republic of China, has been issued, having been compiled by the Railway Department, from the annual reports of the various lines. It is pointed out in a brief introduction that no transport of passengers or cargo of any consequence was done on the southern section of the Tientsin-Pukow raillway, as after the revolution there was little or no business offering, and steady business was only commenced after the connection with the northern section of the line in October of 1912.

A note with reference to the Shanghai-Nanking railway states that the capital of that line is greater than that of any other railway in comparison, and as a result the income derived from the traffic was not sufficient to pay principal and interest of the loan floated for its construction. Great difficulty was experienced on the railway during the revolution which was an additional handicap of a serious nature. Nothing in the way of permanent improvement was therefore done by the Ministry, the desire being to keep down expenses.

The report on each line is divided into four sections, under the headings of first, "General Affairs," second "Construction Work," third "Traffic" and fourth "Miscellaneous," and the Board aims at showing the result of all matters connected with each railway.

Following are two of the reports, (others will appear later) :—

PEKING-HANKOW RAILWAY

General Affairs

Staff Conferences.—The Directors and heads of various departments held monthly conferences when all matters suggested by the employees of the railway were discussed, the points for consideration being circulated in advance to those attending the conferences. Ordinary matters were dealt with by the monthly conferences, any question too important for decision being decided at the semi-annual conferences held in March and September.

Police System.—Formerly the policing of the line was conducted independently of the management of the railway, the police officers being incapable, and the system corrupt. In July reorganisation was commenced, the whole line being divided into three sections. The head office was established at Peking, one Superintendent and three assistants being installed in each section. A special set of regulations was adopted governing the conduct of the police officers. During the first two months following the reorganisation great improvements were made, but a few months later there was a relaxation, many thefts of spikes, etc., from the railway being reported. Another effort was made further to improve the service to safeguard materials, and the patrol force originally under the Maintenance Engineers was converted into a regular patrolling force, a Captain and assistant Captain being stationed on either side of the Yellow River to take charge of the southern and northern sections.

Bureau of Investigation.—The Bureau of Investigation has been placed under the Directors of the railway in Peking, and is controlled by one chief and a special staff of assistants. Qualifications for members of this Bureau are knowledge of railway affairs combined with actual experience on the line itself. A special set of regulations was drawn up for the Bureau, which was divided into two sections—Compilation and Investigation. This Bureau has been of great assistance to the Administration in providing accurate and early reports on the various matters calling for inquiry, and in compiling the reports connected with the line.

Hospitals.—No special hospitals were provided for this railway in the beginning, the French Hospital at Peking being relied upon. The railway contributed a large sum of money to this hospital for medical fees. The Directors decided to establish hospitals under the management of the railway administration, the first being opened at Hankow, where many Chinese foreign-educated doctors were engaged. One Chinese doctor was also sent to Chang Sin-tien. Sickness was frequent during the summer time and the wards had to be enlarged. A doctor was placed in residence in Peking to attend to cases on the line north of Cheng Ting-fu, a ward being opened.

Mr. Chow Tze-chi, Minister of Posts and Communications

Purchase of Materials.—Originally various offices for the purchase of materials enjoyed independent powers and led to great confusion. The Directors therefore decided to establish a central bureau in Peking to which must be referred all requisitions for material. This bureau is under the control of the Engineering Department, the chief and staff being drawn from those originally in charge of purchasing supplies.

Leasing of Lands.—Regulations governing the leasing of land on the two sides of the track were drawn up, and a special officer was appointed to attend to transactions under this head. Notices were posted in the various villages along the railway announcing the policy of the Directors, the measurements and prices of land being fixed by the chief of the bureau. So many farmers applied for land that members of the maintenance department had to be sent to the assistance of the officer employed for this duty to have the work completed quickly.

Litigation.—In view of the many cases at law in which the railway has become involved a special legal adviser was engaged and a special office was allotted for his use in the Peking buildings. All agreements connected with the purchase of materials, and the employment of members of the railway staff are submitted to him.

Construction

Yen Cheng Station.—Owing to the congestion at this point a siding 1,362 meters long was installed, in addition to two new tracks 1,640 metres long, and a triangle shunting track. A water tower was erected. A large area of land was purchased for future improvements, the erection of engine sheds, coal storage yards, and turn-table being contemplated.

Bridge at Cheng-chow Station.—Cheng-chow station is the junction of the Pien-lo Railway, and to relieve the traffic a high bridge was erected for pedestrians. It is built of steel, there being two spans measuring 12.66 metres each. Three steel staircases were provided, measuring 3.2 metres each.

Fencing.—At the May conference it was decided to erect wooden fences around twenty main stations, the work being completed in 1912. It is contemplated to erect similar fences around all small stations.

Chienmen Station (Peking).—Since the Chienmen station is the first big station on the line the Directors decided that the equipment must be adequate and a model for other stations. The platform shelters were made better than those of the Peking-Mukden line and the platforms were improved. The shelter was carried on castiron columns, and canti-lever trusses, being solid in construction and imposing in appearance.

Traffic

Coolie Staff.—The coolie staff has been reorganised. Hitherto coolies have been employed on the recommendation of various officials and were not under control. In May reorganisation commenced, the coolie foremen being discharged. Others were employed at $12 (Mex.) per month, the coolies being paid $7 per month. Special regulations were provided for the transportation and handling of luggage.

Running Time.—On the first of May the train service was reorganised, the time of the journey between Peking and Hankow being reduced from three to two days. The line was divided into three sections. Peking to Shun-teh being the first, from Shun-teh to Yen-cheng being the second, and from Yen-cheng to Hankow the third. Ordinary passenger trains were converted into fast trains, stopping at all stations. A through express train starts from each terminus on Tuesdays and Fridays, sleeping cars being provided, the price of the latter being reduced 15%.

Sleeping Cars.—Sleeping cars containing modern conveniences were provided for the fast trains between Shun-teh and Yen-cheng; the price per berth above the ordinary first-class fare being $4.

Connection with Peking-Mukden Line.—It was arranged that freight on the cargo shipped between the Peking-Mukden and the Peking-Hankow lines should be collected by the de-

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spatching stations, a monthly settlement to be made by the two lines. The principal cargo transported between the two lines was lime and coal from Tuli and Chow Kow-tien, on the Peking-Hankow railway, for Tientsin; compressed cotton from Kao Yih-hsien for Tientsin; non-compressed cotton from various stations on the Peking-Hankow railway for Tientsin. The coal from Lin-chieng on the Peking-Hankow railway is shipped by the Peking-Mukden line as far as Tangku, at the mouth of the River. Anthracite coal from Shansi is shipped from Shih Kai-chwang to all the stations on the Peking-Mukden line. Passengers may also purchase tickets for the two railways at the main stations. Since the enforcement of this system it has proved to be very satisfactory. Traffic receipts were materially increased, and settlements were made at each month end without any trouble.

Tientsin-Paotingfu-Shih Kai-chwang Service.—The greatest volume of passenger and cargo traffic is between these three points and special arrangements were made to have through trains, passing through Feng-tai, and leaving out Peking.

Electric Staff System.—In May the electric staff system was introduced to replace the old idea, accompanied by a telephone system. Special officers were trained and placed in charge.

Signals.—Semaphore signals were established at all stations. At the small stations only two signals were installed, one at each end. At the large stations two signals were installed at each end.

Luggage.—Luggage has been placed under the care of the railway management since May. Prior to that time passengers took care of their own property. Checks can now be obtained when desired by the passenger.

MISCELLANEOUS

Connections with other lines—Similar agreements to that with the Peking-Mukden line have been come to with the Ching-tai and Pienlo railways for the transportation of cargo and passengers.

Finance.—During the first six months the income was $6,047,884.19 (Mex.), the surplus being $2,137,837.50. During the latter half of the year the income was $7,509,829.37, the surplus being $3,108,426.70. The total income was $13,557,713.56. The profits for the whole year amount to $5,246,263.29.

PEKING-KALGAN RAILWAY

GENERAL AFFAIRS

Accounts Department.—During the Manchu *régime* the accounts were kept according to the old style and were in charge of the Receipts Office. In 1911 an Audit Office was established, but the system was far from complete and the result unsatisfactory. On July first the Accounting Department was reorganised, old accounts were closed and new books opened under the charge of the Chief Accountant. Further improvements were made.

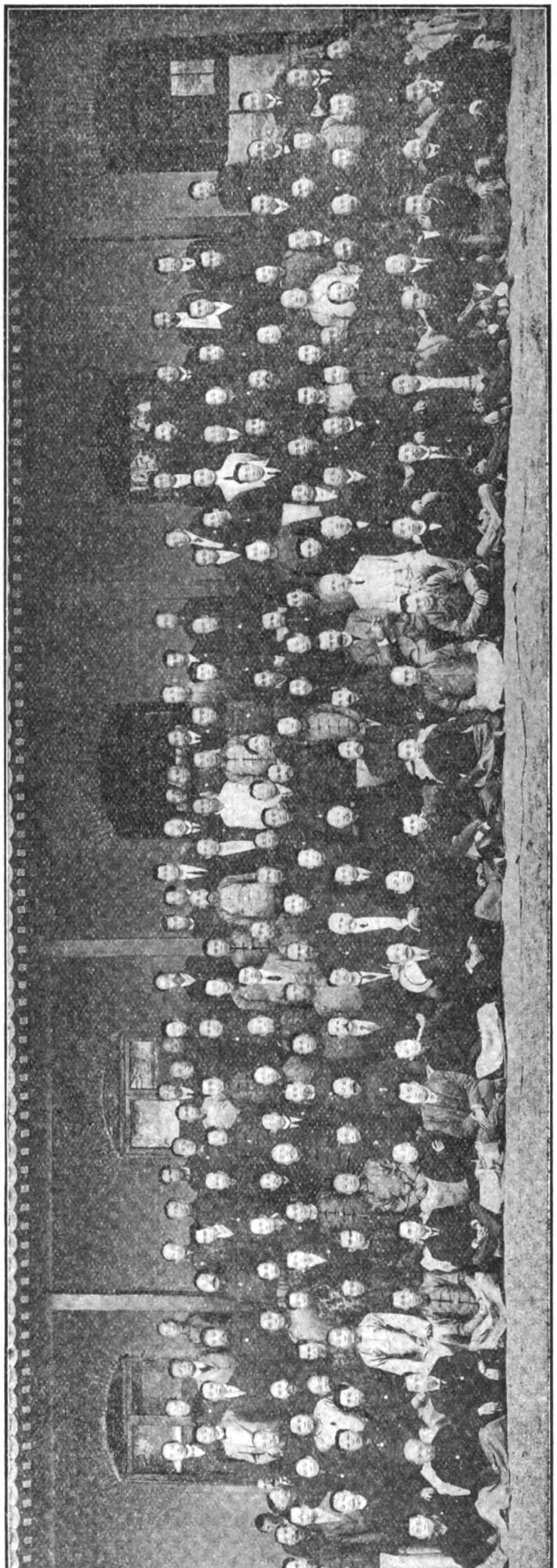
Division of Duties.—The affairs of the railway have been divided into three departments, the old style being found inconvenient. The General Affairs Department, Traffic Department, and Engineering Department now control respective sections, special regulations being created for their guidance. The division of duties has resulted in a lively improvement.

CONSTRUCTION

Nankao Water Supply.—A special water supply was installed at Nankao, 9,200 feet of water pipes being laid. The water is drawn from a high source in the Pass and is therefore a gravity supply. The water tower at the station yards has, however, been retained in case of emergency.

Repair Shop.—A repair shop was established at Nankao in addition to the old workshops, providing for the simultaneous repair of five locomotives. It is estimated that all the engines on the line can be overhauled and repaired in this workshop during a period of two years.

(*Continued on page 182*)



Photograph of officials connected with Board of Posts and Communications at a reception given at Peking as a Valedictory to the outgoing Minister, Mr. Chu Chi-chin, and as a welcome to the new Minister, Mr. Chow Tze-chi. The Chinese seated between the Europeans in the second bottom row are—reading from the left to the right—Mr. Yih Kung-cho, Director-General of Railways; Mr. Chow Tze-chi, the new Minister of Communications; Mr. Chu Chi-chin, the outgoing Minister, now Minister of the Interior; and Mr. Fung, Vice-Minister of Communications. The European on the left of these gentlemen is Mr. Piry, the Postmaster-General, the two on the right being Mr. A. G. Cox, Chief Assistant Engineer of the Peking-Mukden Railway, and Mr. J. E. Foley, Traffic Manager of the same line. Seated in the bottom row, to the lower right of Mr. Piry, is Mr. Mung, the Managing Director of the Tientsin-Pukow railway. Next to him on the right is Mr. Chu Kin-how, Associate Director of the Peking-Mukden railway, while in the same row, below Messrs. Cox and Foley, is Mr. Lo Ching, the Chief Secretary of the Board of Posts and Communications. Third from the right end of the bottom row is Mr. Kuan Men-chun, Managing Director of the Peking-Kalgan railway, and on his right is Mr. Li Tsoi-chee, Managing Director of the Peking-Mukden railway.

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JAPANESE CONCESSIONS IN MANCHURIA

IMPORTANT FEEDERS FOR SOUTH MANCHURIA RAILWAY

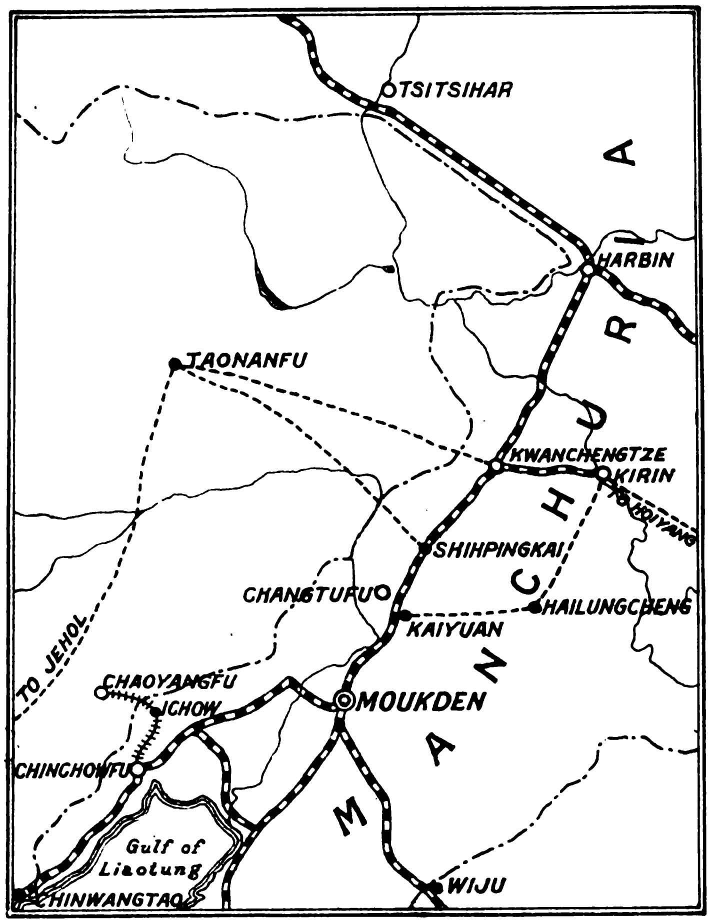
Considerable interest attached to the announcement early in October that Japan had secured certain railway concessions in Manchuria. At first the reports were somewhat indefinite in character, but it finally became known that the concessions embraced five lines. These were the following:—

Shihpingkai to Taonanfu; Kwanchengtze (or Changchun) to Taonanfu; Taonanfu or Chengchintun to Jehol; Kaiyuan to Hailungcheng and Hailungcheng to Kirin. Also the right to construct the line from Kirin to Hoiyang (or Hoiryong) in Korea is said to have been reaffirmed. The full terms of the agreement have not been published, but it appears that it was agreed that all these lines, except that between Chengchintun and Jehol, should be built with loans issued in Japan on the same conditions as the Tientsin-Pukow Railway loan. Regarding the Chengchintun-Jehol line it was agreed that in the event of the Chinese Government undertaking to build that railway in the future, it would refer the question to Japanese capitalists.

According to the *Tokio Asahi*, the idea of connecting Taonanfu with the South Manchuria Railway originated when the Chinchow-Aigun project was first brought forward. It was then Japan's intention to approach China for a concession that would involve a connection between the Chinchow-Aigun line and the South Manchuria Railway. The matter was not, however, definitely taken up until a few months ago, when the rebellion broke out. Negotiations were entered upon with the Japanese Minister at Peking, but progress was slow, and moreover Japan could not then conclude a loan without referring it to the Quintuple Group. Just about this time, says the *Asahi*, the dispute between Japan and China over the Nanking and other incidents occurred, and this furnished Japan with an opportunity to press China to grant the railway concession. Subsequently the Quintuple Group changed its policy in regard to industrial loans, and this enabled the signature of the agreement on October 5.

Referring to the nature of the proposed lines the *Asahi* states that the Shihpingkai-Taonanfu line will be 230 miles in length. The district between Shihpingkai and Chengchintung (which lies about 65 north-west of Shihpingkai) is rich and well populated. The rest of the line traverses the plain of Siliaho.

The Changchun-Taonanfu line, 180 miles in length, remarks our contemporary, appears to be superfluous if the Shihpingkai-Taonanfu line is to be built. The Chengchintun-Jehol line is 470 miles long, and it will be easily realized that it will be very difficult to extend this line further south towards Peking, therefore the business prospects of this line are anything but bright, unless another line is built to connect Jehol with Chinchow or a point on the Peking-Mukden railway. The Kaiyuan-Hailungchiang line is 120 miles in length, and will prove a



EXISTING LINES..................
PROPOSED JAPANESE LINES............
PEKING-MOUKDEN LINE BRANCH.........

profitable feeder to the South Manchuria railway because it traverses a rich country. The Hailungchiang-Kirin line is 110 miles in length, and will also indirectly serve as a feeder to the South Manchuria railway.

The *Tokio Asahi* states that of the five intended lines, comprising in all a length of 1,100 lines, the only useful line in connection with Japan's undertakings in Mongolia is the Shihpingkai-Taonanfu line. Conceded that the lines from Kirin to Heilungchiang and from Heilungchiang to Haiyuan are of practical value, these added to the Shihpingkai-Taonanfu line, would be 460 miles in lenght, but the remaining two lines can scarcely be regarded as of any value. In short, what Japan has secured compares very unfavourably with the railway concessions secured by England, France, and Russia in various parts of China. However much inclined the Foreign Office may be to boast of its success, the *Tokio Asahi* is of opinion that what it has secured hardly conforms to the requirements of the national activity.

It has been stated that the full terms of the agreement for these lines have not been disclosed, but reports have been published that the term of the loans is to be 50 years and the rate of interest 5 per cent. per annum. It is provided that the railways may be sold to China after the thirtieth year. The railways will be the security for the loan. All officials occupying responsible posts will be jointly selected, but the Engineer-in-Chief will be Japanese. Materials required for construction are to be bought through the lenders. The amount of the loan is said to be £3,000,000, with power to increase to £5,000,000 if necessary.

Surveys of these lines are now being carried on and construction work will probably shortly be begun.

Since the above was written it has been stated that the Japanese do not propose to construct the Changchun-Taonanfu line at present, although their right to do so has clearly been secured. A Peking telegram to the *North-China Daily News*, dated October 29th, says:—The situation with regard to the recent Japanese railway schemes is as follows:

Japan has arranged with China to supply funds for the construction of two feeder lines to the South Manchurian Railway, from Taonanfu to Shihpingkai and from Kaiyuan to Hailungcheng, a total distance of 300 miles. They have further arranged that in the event of China desiring to employ foreign capital to build railways between Jehol and Taonanfu, Taonanfu and Changchun, Hailungcheng and Kirin, approximately 700 miles, Japanese capital shall have the priority.

These arrangements have been the subject of an exchange of notes between the two countries, but no definite agreement has been signed, nor are the terms yet settled. Obviously, however, the Japanese, in consideration of the provision of money, are entitled to preference in the matter of the supply of material, construction and future management.

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An interesting point in the above arrangement is that China, in giving the prior rights to Japan in connection with the Jehol-Taonanfu line, has violated the Chinchow-Aigun railway agreement with America, which provided for the construction of a line following practically the identical route for nearly 300 miles from Chaoyang to Taonanfu. When retiring from the Quadruple Group last February, the American group specially stipulated, and duly notified China, that they retained all rights under the Chinchow-Aigun Agreement.

In these surprising circumstances it is natural that the American group should have registered a vigorous protest in Peking.

British interests are also concerned, for the agreement provided that while the money was found by America, the work of construction should be undertaken by a British firm, Pauling and Co. British remonstrances, therefore, will doubtless be registered in due course.

THE SOUTHERN PACIFIC ROUTE

Important Acceleration of Service

Only two half business days need be lost in the trip from San Francisco to Chicago since the Southern Pacific's new Overland Limited $10 extra fare train de luxe was established on April 5th. The time for the 2,276 miles was cut from 69 hours to 65 hours, a saving of four hours. By leaving San Francisco Friday at 2 p.m. a passenger reaches Chicago on Monday morning at 9 o'clock, thus losing half a day Friday and the business half of Saturday. Close connections are made with limited trains to New York, so that one can arrive there the morning of the fourth day at 9.30 o'clock, bathed, shaved, breakfasted and ready for business.

Splendid Equipment.

The Westbound Overland Limited leaves Chicago at 7 p.m. daily, arriving in San Francisco at 9.30 o'clock on the third morning. These trains have new all steel equipment of the latest model, including a composite buffet clubroom car with barber shop and shower bath; dining car, standard Pullman sleeping cars and drawing room compartment observation car with ladies' parlor; library containing best selection of books, current magazines and periodicals, and also a stenographer.

These trains run via Southern Pacific, Union Pacific and Chicago and Northwestern.

A new train, the Pacific Limited, has been established between San Francisco and Chicago, leaving San Francisco ferry station at 10.20 a.m. daily, arriving in Chicago at 9.15 o'clock the third morning. Its new all steel equipment consists of standard Pullman and tourist sleeping cars, dining and Pullman observation car. The observation car contains a ladies' parlor, with library of latest fiction and magazines, writing desk and stationery.

This train leaves Chicago westbound at 10.45 a.m. and arrives at San Francisco, ferry station, at 8.50 o'clock the third morning.

East on St. Paul Line

The Pacific Limited runs via Southern Pacific, Union Pacific and Chicago, Milwaukee and St. Paul railway and is the fastest train between San Francisco and Chicago handling a tourist sleeper, making 69 hours' schedule between these points. The fastest train on which tourist cars were handled previously was on 83 hours' schedule. No extra charge is made on these trains.

These trains make connections at Chicago with limited trains of eastern lines, arriving in New York the fourth morning from San Francisco.

Train No. 10, the California Mail, leaves San Francisco ferry station, daily at 11.40 p.m., instead of 7 p.m. as formerly, arriving in Chicago at the same time as before or 8.30 o'clock, fourth morning, reducing the schedule 4 hours and 40 minutes. Westbound train No. 3 arrives in San Francisco at 1.30 p m., instead of 3.10 as formerly.

These trains have through tourist and standard Pullman sleeping cars between San Francisco and Chicago via Southern Pacific, Union Pacific, and either the Chicago, Milwaukee and St. Paul railway or Chicago and Northwestern railway from Omaha to Chicago. They have dining car and observation buffet clubroom car.

Further information relative to American Railway travel can be secured from Mr. G. H. Corse, Jr., General Passenger Agent, San Francisco Overland Routes, No. 4 Water Street, Yokohama, Japan.

IRON IMPORTS INTO SIBERIA

The Vladivostok Bourse Committee furnishes some interesting figures touching the position of the iron market for 1912. The import of iron during that term exceeded the 1911 figures by 322,000 pood. The demand in the Amur region for various descriptions of iron and iron goods is annually increasing, but as yet quite 88 per cent. of this demand has to be supplied from abroad. Excluding special freight for the Amur Railway imported during the year under review to the amount of 4,880,000 pood, the total import of iron, cast-iron, steel, and iron-ware was distributed according to country as follows:—

	Thousand of pood
Germany...	1,872,000
Russia ...	283,000
Japan ...	99,000
China ...	45,000
Other countries...	68,000
Total ...	2,367,000

Reckoned by percentage, Germany's share was 80 per cent., Russia's 12 per cent., Japan's 3 per cent., China's 2 per cent., and other countries' 3 per cent.

It may be noted that the imports from Germany under this head comprise machinery, iron-ware, sheet iron, rails and other railway accessories, steel-ware, cast-iron ware, pipes, wire and wire goods, steel hawsers, axes, shades, ploughs, corrugated iron, scrap iron, nails, etc.

The varied character of the iron consignments required by the province very appreciably retards the establishment of iron works upon a large scale. It is a fact that attention has already been directed to the Olga region in the Primorsk, which is the richest in iron ore, running as high as 76 per cent. of pure iron as the future centre of a great iron-working industry, since this region is known to abound with coke coal. But it is impossible at the moment to build such a work relying solely upon the local demand for iron. According to technical data the equipment of a foundry with a productive capacity of less than two million pood annually would be unprofitable, whereas the local demand, although it exceeds two million pood, is made up of so many different kinds of iron goods that to supply it would require not one but several special iron works. Nevertheless these considerations should not be permitted to discourage capitalists since the fact should not be overlooked that right at hand is a market of colossal capacity, Japan to wit, while furthermore, with the annually increasing industrial development of the province, the demand for iron and iron ware is bound progressively to expand.

SARAWAK OIL OUTPUT

A telegram from Singapore reports that rapid progress has been made with the production of petroleum at Sarawak. Several wells at shallow depths have come in, giving a sustained production, and at a much deeper level a second oil stratum has been struck.

Large and regular shipments of the oil are taking place; the motor ship Juno being employed for this purpose, and the oil being treated and the Shell Company's refineries in Sumatra.

It is satisfactory to be able to record that the long-wished-for discovery of petroleum in this territory under British jurisdiction is established.

PEKING-KALGAN RAILWAY

(Continued from page 180)

Water Tower at Hsi Chih-men.—The water tower at Hsi Chih-men section (Peking) was enlarged from a diameter of thirteen feet to twenty feet, and another water tower was erected at Kiaoliang bridge to supplement the supply by gravity.

Signals.—Up-to-date signalling has been installed to meet the requirements of increased traffic, similar to that on the Peking-Mukden line.

Hsi Chih-men Station.—Land was purchased near the station to increase the shunting yard and enlarge the station. Five shunting tracks were laid down, and space for two godowns is available for lease.

Nankao Pass.—Seven retaining walls have been erected in the Nankao Pass to prevent landslides and the fall of rocks on the line.

Shunting Tracks.—At Chingho 350 feet of shunting track was laid; at Kang-chung 2,748 feet; at Kalgan 400 feet of rails were laid to provide a loop to connect with the Chang-sui Extension. In all there are twenty-one new shunting sidings on the railway, which are estimated as sufficient for present needs.

Engine Sheds.—The engine shed at Hsi Chih-men has been lengthened 70 feet. A new engine shed was erected at Nankao 250 feet in length, one was built at Kang-chuang 96 feet in length and one at Kalgan 200 feet in length.

Traffic

A through passenger and goods agreement has been made with the Peking-Mukden railway.

The large quantities of linseed and other products offering compelled an increase in rolling stock. During the year the Tongshan works were instructed to build 140 freight cars. A portion were delivered in 1912. Cars were borrowed from other lines to meet requirements.

Electric Staff.—An electric staff system was introduced for the work of the traffic over the Nankao Pass. Telephones were also installed, portable ones being carried on the various trains for use in case of accident.

Heating—Third class cars were provided with warming stoves; the coal consumption being half a ton per month per car.

Locomotives,—Special Mallet locomotives were ordered for work on the Nankao Pass from the American Locomotive Co. One locomotive was borrowed from the Tientsin-Pukow Railway to assist in dealing with traffic. Additional locomotives are required for the Chang-sui Extension.

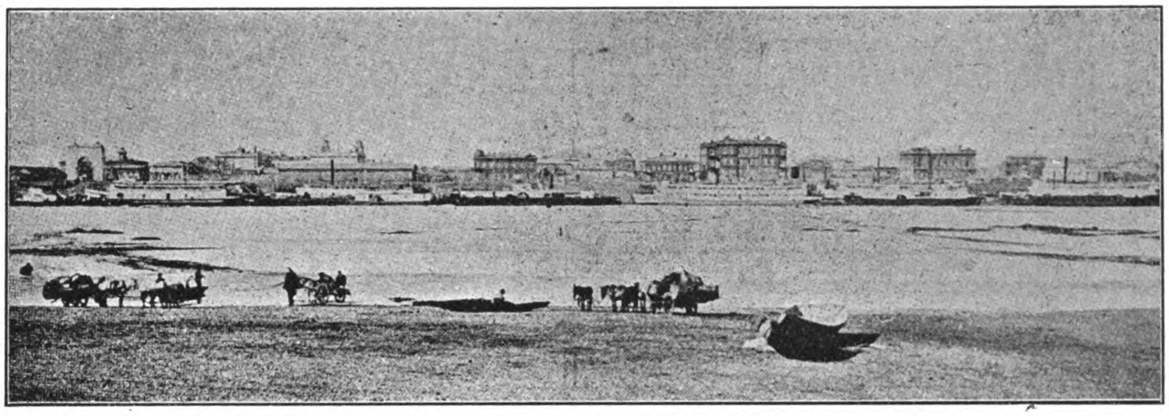
Miscellaneous

On account of the precipitous nature of the country great difficulties are encountered between Nankao and Kang-chung, freight trains having to be divided into three sections in order to be hauled over the Pass. The larger locomotives will obviate this necessity. From July 1 all available locomotives were pressed into service, thirty-six trains per day being run.

POSSIBILITIES OF THE AMUR REGION

A LAND OF LIMITLESS RESOURCES

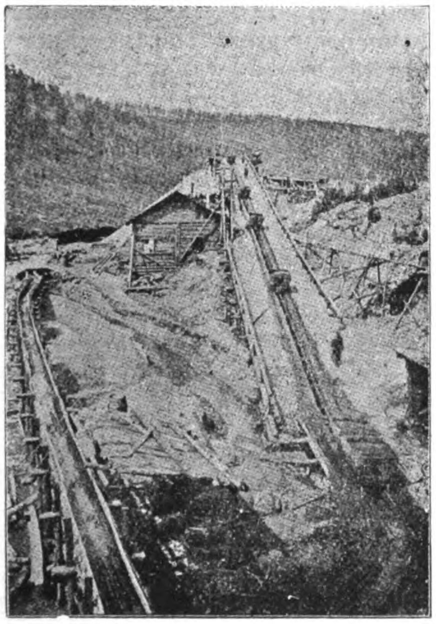
“A land of boundless possibilities and limitless resources.” That was the description given to the Amur Region by Mr. E. S. Little of Shanghai, who recently made a journey through this imperfectly known part of Northern Asia. The unrest in China during the last two years, and the development of Russian policy relative to Mongolia, has caused increased attention to be directed to those areas where the Russian and the Chinese are brought into contact. It will be of interest, therefore, briefly to trace the history of the Amur Region and to add a synopsis of the most recent references to its development and possibilities.



Blagoveshchensk, the Metropolis of the Priamur

An Historical Retrospect.

Those who have taken any interest in the history of the Far East are aware that Russian association with the regions beyond Siberia began in the seventeenth century. It was found difficult, however, for the rude Cossacks who were Russia's pioneers, to gain a firm hold, although they spread over the region, and in 1689 by the treaty of Nertchinsk the Tsar restored the whole of the Amur country to China. For more than a century and a half the Russian advance eastwards was checked, but the appointment of Count Muravieff in 1847 as Governor-General of Eastern Siberia, marked the beginning of a new era.



The Amur Railway. Gold washing plant on the Amur River

Muravieff, within a year of his appointment explored the mouth of the Amur and wrote to the Tsar that he might consider the whole of the country on the left side of the river as part of the Empire. In 1858 Russia's hold on this territory was legalised by the treaty of Aigun. Count Ignatieff in 1860 went to Peking to secure the ratification of the treaty, and arrived at an opportune moment when he was able to render important services in arranging a cessation of hostilities between China on the one part and Great Britain and France on the other. In November of 1860 he concluded a treaty with China which not only confirmed the treaty of Aigun, but further ceded to Russia the whole Pacific coast from the Amur to the frontiers of Korea.

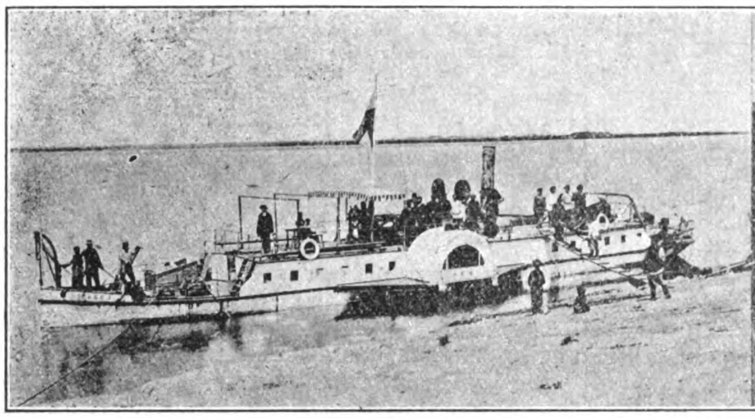
In order to render secure her possession of the huge area won principally on the battlefield of diplomacy, Russian military colonists, religious and political exiles, criminals and a few voluntary settlers were drafted into the country. But the conditions of life were awful. There were practically no roads and none of the amenities of civilization were available. The early settlers suffered great hardships through the rigours of the climate; floods were frequent, and pestilence carried off hundreds. The machinery of Government was very imperfect. Wandering tribes occupied (and still occupy) the hilly regions to the north.

In spite of the hardships of the individual settler it was recognised that the country when opened up would support a large population. The mineral and timber wealth were known to be practically inexhaustible; the rivers teemed with fish; the plains promised well for agriculture. It was early realised that a railway line between Vladivostok and Khabarovka, the political capital, would open up the fertile littoral, and this line was pushed on with all possible speed. A policy of encouraging settlers has been consistently pursued and newcomers are granted 270 acres of land and advances of from £15 to £45 in money. Moreover they, and their families, are transported by railway from Russia free of charge. Colonization is, however, proceeding but slowly. The completion of the railway from Stretensk to Khabarovka, which is expected in 1916, may enable greater progress to be made in this respect.

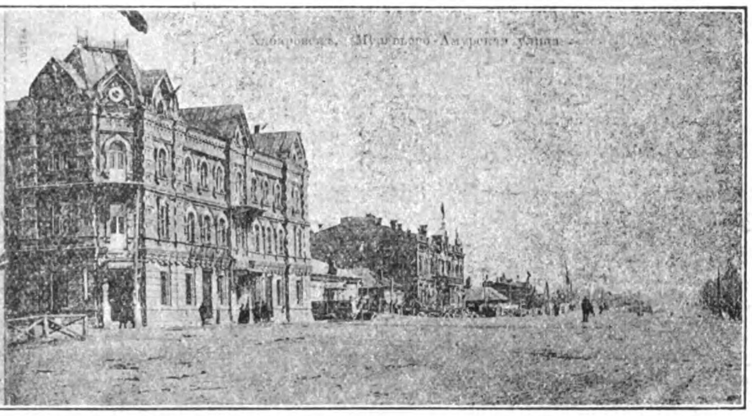
What Russia Has Spent.

A correspondent writing to *The Times* (London) states that the Russian Government, in the fifteen years, 1892-1907, spent no less than £75,000,000 on the Amur provinces. If this huge sum of money had been devoted solely to development, the provinces would be much more advanced than they are at present, but unfortunately the bulk of the appropriation went for military purposes. It is stated that only about £10,000,000 was applied to the develop-

Construction work on Amur Railway



Chinese Eastern Railway Steamer plying on the Sungari River from Khabarovka on the Amur

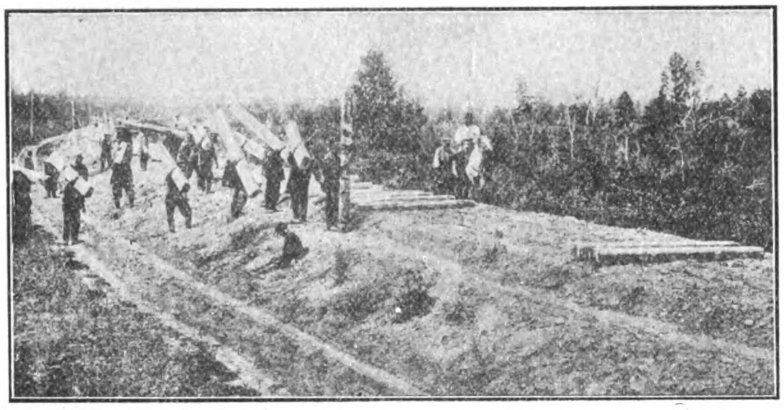


Building on Amur Street, Khabarovka

ment of the country. After the Russo-Japanese war it became a political necessity to hurry on the construction of a railway traversing only Russian territory, and as readers of the FAR EASTERN REVIEW know this work is being carried on as rapidly as the gigantic cost and immense physical difficulties permit.

THE RIVER AMUR.

The Amur is one of the great rivers of the world. From its sources near Urga in Mongolia to its mouth at Nicolaievsk, in the Gulf of Tartary, opposite Saghalien, it traverses thirty-five meridians of longitude; its total length being about 2,500 miles. The Amur from the junction to its two western forks, the Shilka and the Argun forms the northern boundary between Manchuria and the Russian "government" of Amurskaia for a distance of 1,089 English miles, from Pokrovkaia in the west to Khabarovska at the junction with the Ussuri in the east. During six months in the year, the Amur is navigable for 1,500 miles of its course by steamers drawing four feet of water, as far as Stretensk in Transbaikalia, whence a branch railway, via Nerchensk, connects with the Trans-Siberian line at Chita. The Sungari joins the Amur at a point 150 miles above Khabarovka. The Chinese name of the river is Hei Lung Kiang (River of the Black Dragon) and its name is borne by the largest of the three Manchurian provinces.



Construction Work on Amur Railway

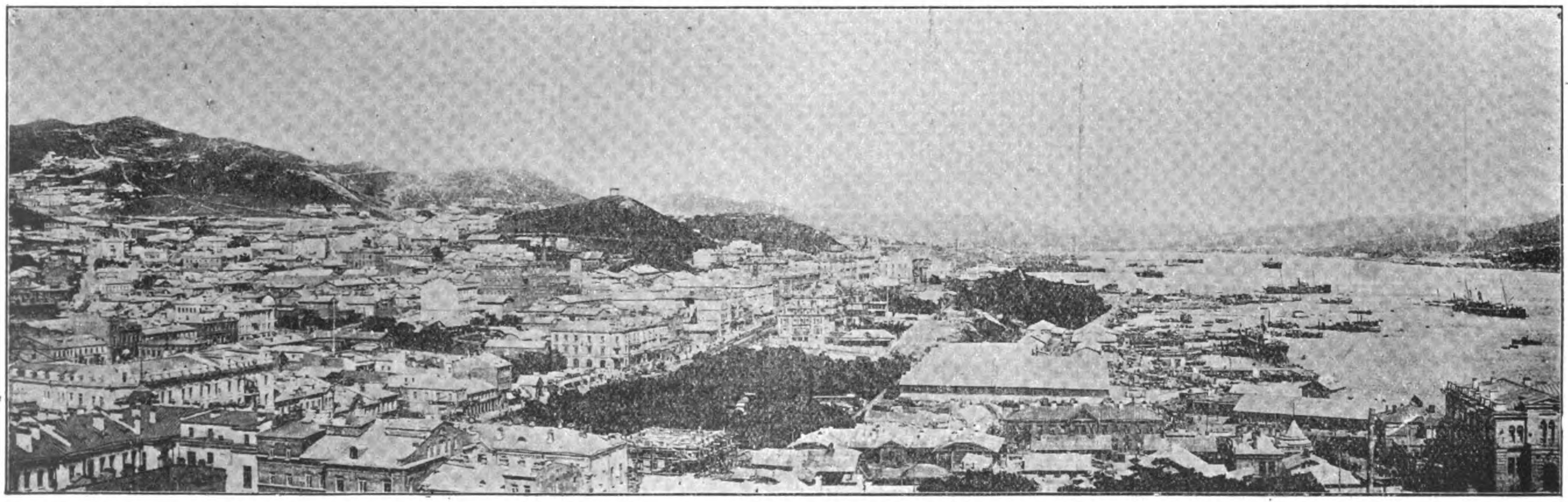
According to an authority quoted by Mr. Little, the rivers, navigable for small steamers, sailing boats and rafts aggregate a total length of 42,000 miles.

THE AMUR RAILWAY.

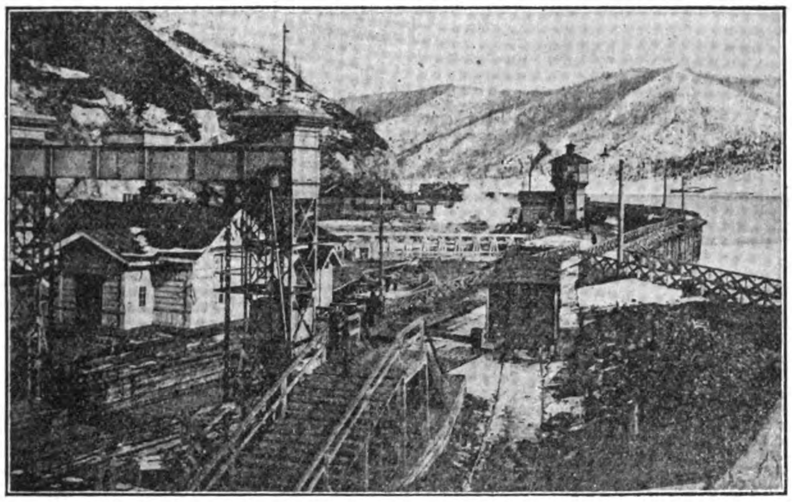
It was originally intended to build a railway from Vladivostok to Khabarovka and thence parallel to the Amur River to join the Trans-Baikal line at Chita. The first sod of the railway was turned by the present Tsar of Russia at Vladivostok in May, 1891. After the line reached Khabarovka, however, it was decided, in view of the great difficulties, physical and geographical, to build the line across North Manchuria (in Chinese territory), thus shortening the route by 514 versts. An agreement was signed in 1896 by which China approved of this plan, and in 1903 the line was thrown open to regular traffic. As a result of the Russo-Japanese war, however, as already stated, it became necessary to revert to the original plan of building a line running parallel to the Amur. The total length of the line, including the branch to Blagoveshchensk, will be 1,972 versts.

PROSPECTS FOR THE FUTURE.

What it may be asked is the probability that Russia will within any reasonable time, recoup herself for the immense amount of treasure she has expended on this territory that was secured at such a



View of Portion of Vladivostok



Siberian Railway: Lake Baikal Station

Sansing in North Eastern Mongolia

low cost, but retained only at huge monetary sacrifice? The answer seems to be that, apart altogether from politics, Russia seems to be likely to reap her economic reward. We may quote in this connection an extract from the report of a correspondent of *The Times*. He says:

"The chief riches of the Amur are gold, forests, and fish. There are estimated to be over 300,000,000 poods (5,000,000 tons) of high-grade ore. The gold industry in the Far-Eastern colony is now in a very primitive state, washing of the simplest kind is applied, and the work is confined to places accessible without the outlay of capital. Chinese are the principal workers; they have to deliver a certain amount of gold or money to their employers, and are left to find it as they like. Without guidance, organization, or proper instruments, they are doing the work in a most unproductive way, and the whole output of the colony ranges from 500 to 1,000 poods of gold per annum. Some of the companies are trying to apply better methods.

"There are over 200,000 square miles of forests, insufficiently surveyed and very little worked. The trade is in the hands of small concerns, which usually evade official control. Since 1907 several very large timber companies have been established. They run the business on more productive lines, and are winning foreign markets for the Amur timber. The first timber concession was granted to a British subject, Mr. H. C. Sleigh, who, during the four years of the concession (1907-11) exported over 400,000 logs to Australia.

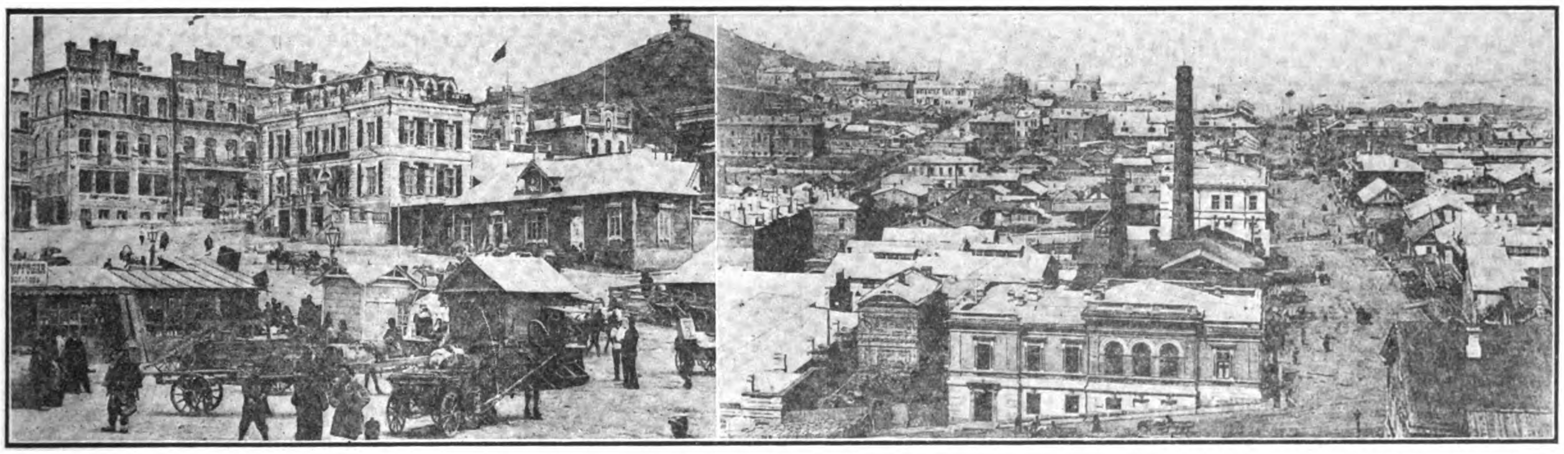
Mr. E. S. Little

"As to the fisheries, the greater part of the business is conducted by the Japanese, who are making good use of the Fishery Convention they concluded in 1907. Japanese capital controls the majority of the largest fisheries and rules the market. Japan imports a large proportion of the fish, and Russian fishery concerns are trying hard to emancipate themselves from Japanese influence, but this can only be done by finding another market for the Amur salmon.

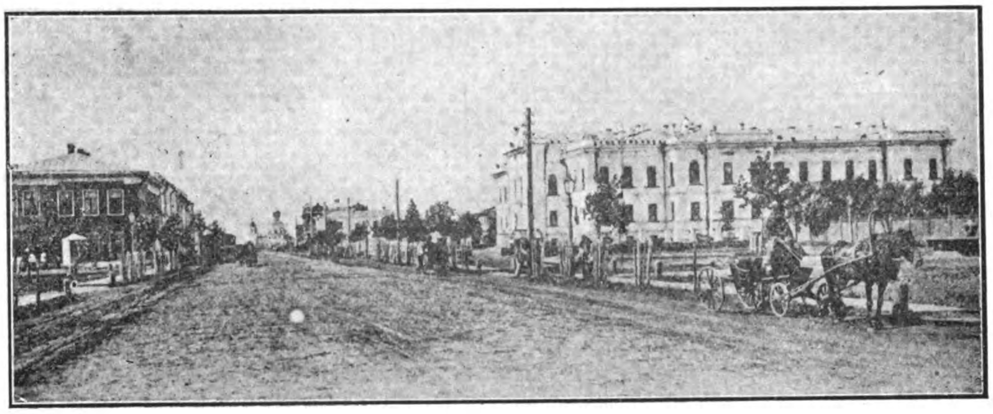
A First-Hand Impression.

Mr. E. S. Little, who only returned from his journey through this region in September, says:—

"The whole of this great country is filled with immense possibilities. The great plains are covered with a rich grass 3 or more feet high, which can be made to support millions of cattle. The winter, it is true, is a long and rigorous one, but is in no sense worse than the winters in European Russia or in North America. There are no insuperable



Detailed Views of Vladivostok



Tiumen

difficulties in keeping cattle alive and well during the winter season.

Those great plains can produce cereals in vast abundance. The Rivers should be filled with craft carrying away the grain which ought to be grown there. Instead of this, however, the steamer upon which I travelled was landing at all the little settlements bags of flour for the use of colonists. In addition to the agricultural possibilities there are rich deposits of all kinds of metals and minerals. At Blagoveshchensk and Helampo, Russian and Chinese cities on opposite sides of the Amur, one sees in various languages most frequently a small notice that gold dust and gold are received here. Great quantities of gold mined in the region are brought into these cities; a little of it finds its way down to Shanghai, but the bulk of it goes west into Russia. The mineral wealth of the country, however, is as yet virgin and untouched. Vast forests cover extensive areas, hill and plain land; so great are they that one expert stated to me that 8,000,000 or 10,000,000 fine trees could be cut every year for hundreds of years without in any way destroying the existence or the usefulness of these forests. The rivers, especially when they come down towards the sea, are filled with great quantities of most excellent fish. At Nikolaeivsk I saw thousands of tons of fish; beautiful salmon could be purchased for a few cents a pound."

Some Statistics.

Figures, though they are seldom attractive reading, often tell their tale more clearly than the written or spoken word. The following statistics for Vladivostok for 1912 for export business and shipping are taken from an interesting report on the Amur region supplied to the *Japan Advertiser* by its Vladivostok correspondent:—

The principal articles of export abroad through the port of Vladivostok in 1912 were the following: Beans, 19,386,790 pood (pood = about 38 lbs. avoirdupois): bean-cake, 265,141 pood; bran, 184,174 pood; and hemp-seed, 447,636 pood.

From 1910 to 1913 the timber exported was made up of the following kinds; aspen in logs, 852,617 pood; fir logs, 24,304 pood; in planks, 75,208 pood; hardwood in logs, 5,787 pood; and veneer, 65,242 pood; total 1,030,022 pood.

Of the total quantity of tea conveyed there by sea the local market consumes 4,000 pood annually, while the balance proceeds in transit to Siberia and Russia via Irkutsk.

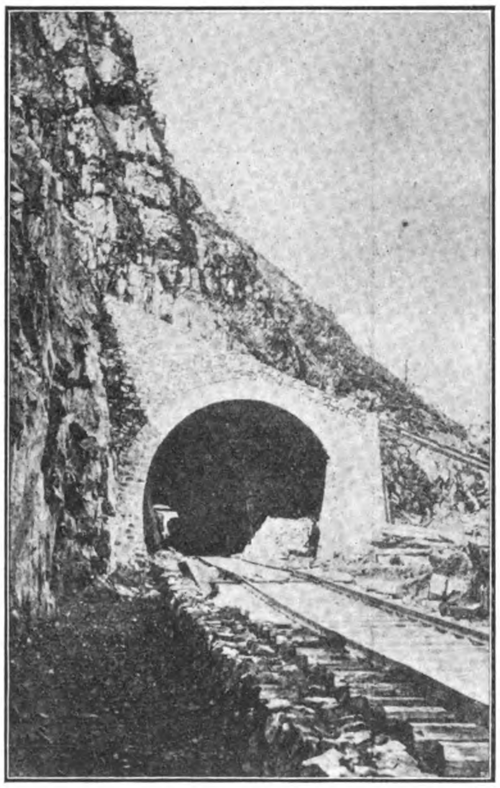
The import of tea for the last five years was as follows. 1908—2,987,000 pood; 1909—2,892,000 pood; 1910—3,904,000 pood; 1911—2,680,000 pood; and 1912—2,930,000 pood.

Coastwise trade operations of late bear witness to the strong development of commercial relations between Vladivostok and points on the Bay of Peter the Great. The animation of the coastal strip reflects appreciably upon the state of the coasting fleet.

Comparative figures of the past two years show a great increase in the number of vessels, both steam and sail, together with the growth of freight, thus: In 1911, 8,073 vessels entered with cargo amounting to 10,017,878 pood; in 1912, 10,683 vessels with 17,409,997 tons of cargo. The export for these two years is shown by the following figures: In 1911, 7,879 vessels cleared with 2,142,949 pood of cargo; in 1912, 10,609 vessels with 2,289,308 pood.

The Political Future.

It is difficult to foresee what the political future of the Amur Region may be. In spite of the strenuous efforts of the Russian Government to induce colonisation, as has been suggested earlier, the results have not been altogether satisfactory. In rural Russia conditions are sufficiently primitive, but the peasant in Russia enjoys comparative luxury when the facilities he enjoys are compared with those available to the settler east of Baikal. Until the conditions of existence for the settler are ameliorated it will be difficult to secure colonisation on a scale that would secure Russia in her possession of the territory. We read in the article quoted from more than once:—"Road-building is neglected, medical aid practically non-existent, educational wants badly provided for; in short even the unexacting Russian peasant finds the primitive conditions of the Amur unbearable." But while the Russian colonist coyly hangs back, the Chinese and Koreans are evincing an ever increasing desire to settle in these localities. The conditions that appal to the Russian colonist are no worse than those to which the Koreans and Chinese have been accustomed from time immemorial. The number of Koreans in the Amur provinces has increased from 2,300 in 1898 to over 75,000 at the present time, while there are several hundreds of thousands of Chinese. Russia is still being taught the lesson that a political conquest of the Chinese inevitably involves the economic defeat of the conqueror. Every effort is being made to keep Asiatic colonists out of the provinces, but the difficulties in the way of accomplishing this are numerous, not the least being the pronounced objection of the Russian traders and mill-owners to being hampered in their operations by a shortage of labourers. As has already been suggested the completion of the Amur Railway in 1916 may make some alteration in this state of affairs, but there seems good ground for supposing that Russia will have to share with the Chinese and Koreans the economic resources of the region lopped off from the Chinese Empire by the adventurous policy of Muravieff, seconded by the astute diplomacy of Ignatieff.

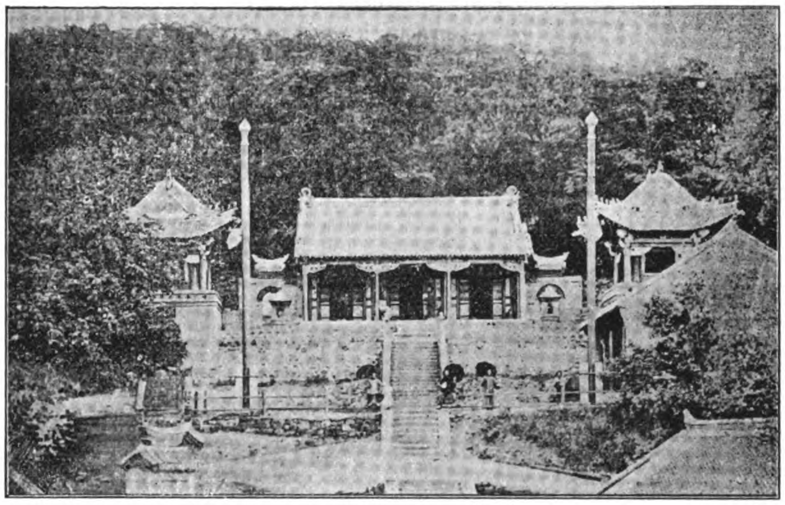


A Tunnel in the Circumbaikal section of the Siberian Railway

The Exclusion Policy.

A certain Japanese business man who recently returned from Vladivostok, speaking through the columns of the *Osaka Mainichi,* said that Governor Gondatti's policy of the exclusion of the Chinese from the Amur is at once unwise and unpractical. His high-handed measure will only jeopardise the economical conditions in the Far East. According to the result of an investigation conducted by the Vladivostok Chamber of Commerce, the stores and factories in

the city numbered at the end of last year 2,812, of which 1,023 were controlled by Chinese, 940 by Russians, 192 by Japanese and 27 by Koreans. The owners of these shops and factories numbered 11,146 in all, of whom 6,751 were Chinese, 3,487 Russians, 462 Japanese, and 446 Koreans. As these figures show, the commercial and other industrial undertakings under the control of Russians occupy no more than forty-two per cent. of the total, and the Russian merchants only thirty-one per cent. of the whole number,—that is, Orientals comprise sixty-nine per cent. of the whole resident merchants and control fifty-eight per cent. of the undertakings. The majority of the labourers, factory hands, and draymen are also Chinese and Koreans. Then, again, according to the Tax Superintending Bureau at Khabarovka, the shops and factories number 1,996, of which 1,161 are under the control of Russians, 762 are controlled by Chinese, 64 by Japanese and 9 by Koreans. The value of trade and industry of the city aggregated last year about 30,568,500 *rubles*, of which the Chinese claim 5,661,500 *rubles*, the Japanese 227,500 *rubles*, and the Koreans 89,000 *rubles*. From these facts it must be concluded that the bulk of commerce and industry in the Amur is in the hands of Chinese. The influence of the Chinese residents is already too deep-rooted in the Province to give way to any high-handed measure by the Russian authorities. The policy of Governor Gondatti would thus prove no more efficient than a drop of water on a red hot stove, all the execution of the policy would bring being at the best the arrest of travellers who have no passports.



Kirin, the Governor's Summer Yamen

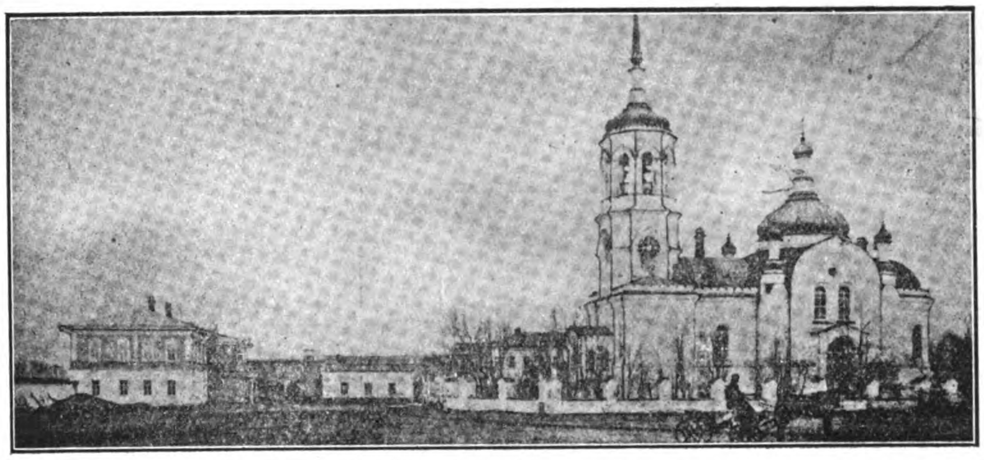
CHINA'S PREMIER'S POLICY

On September 15, the *Government Gazette* published a declaration of Premier Hsiung Hsi-ling. A free translation (states the *Peking Daily News*) of the declaration is as follows:—

The cause of the decay of a nation can be directly traced to the corruption in official life. Just prior to the fall of the Ching Dynasty, great chaos prevailed in the official circle and there was open bribery which brought about the Revolution in 1911. In the Ching Dynasty, there were regulations and restrictions regarding the appointment and promotion of officials, and there were certain formalities which must be observed. But since the establishment of the Republic, all such restrictions and formalities no longer control the action of officials. The place-seekers, taking advantage of the non-existence of such formalities and restrictions, resort to corrupt influence in order to get high government positions. "The path of the wise was crowded by nonentities. The administration was obstructed and official discipline relaxed." In view of such corrupt circumstances, the country is in grave danger. My greatest hope is to turn this evil tide. I will set myself as a prototype to encourage all of my colleagues and government officials to observe rectitude and integrity.

The regulations governing the appointment and dismissal of officials in the civil service was promulgated some time ago by the President, and civil service examinations will be held. All the provisions in the regulations will be strictly carried into effect so that those who are able may be employed or those who are incompetent may be dismissed. Once we get all the good men into the official ranks, then the administration of the whole country can be efficiently conducted.

The Republican era has just begun and there is a multitude of reforms to be effected in the country. For doing all this work, a large number of competent men will be required. As it is impossible for me and my colleagues to know all the capable men in the country, we will keep a record in our offices, registering the names of all persons who are qualified for public service. In that record will be written the names of graduates of the technical schools, their capabilities and the like. Those who come to us with letters of introduction containing empty words will not be taken into government service, and those who recommend themselves and tell of their own acquirements will be submitted to a rigid examination before they will be employed. By all these means, we will endeavour to place the right men in the right places.



The Yarlikowskaya Church at Tomsk

The foundation of a republican government lies in the high and disinterested sentiment of the people, while the officials who are entrusted by the people with the administration of the country must be upright and honest. If the public servants entertain sordid ideas and perpetrate misdeeds, they betray the trust of the people and are criminals in the eyes of all citizens. While young, I studied the odes and classics and the doctrine of rectitude and probity which have deeply influenced me. Since I entered official life, I cannot say that I have never committed any mistake in the way of discharging my duties and employing men, but one thing I can say without reserve, that is, that I have never tampered with public funds. I am now occupying a very important position in the country, and will strictly adhere to my principles and distinguish between virtue and vice. Any one who tries to bribe me into giving him a position will be severely punished. I shall consult with the Judicial Bureau to frame up a code providing the most severe punishment for those who are guilty of embezzling public funds. In my administration I shall do my best to stamp out graft and make it as clean as possible.

I will attend to my business in person and will not delegate my authority to any person. If I find anyone who is using my name to advance his own interest, I will hand him over to the court, even though he be my nearest relative.

China is in extreme danger and what can save her is purity in official life. Although I am well aware that my ability and knowledge is not enough to judge talents I love ability as my life and hate crookeness as my enemy. I will do everything in my power for the country according to the dictation of my conscience.

JAPANESE IRON FOUNDRY

The *Jiji* quotes General Nakamura, Director of the Imperial Foundry, Japan, as follows on the working of the foundry:—The foundry is now in course of extension. In carrying out the administrative reforms just effected, part of this work of extension has been carried forward, the staff has been reduced, and expenditure curtailed, but not in a way to interfere with the operation of the concern. As a result of the first stage of the extension of the foundry, made in 1909, new machinery was added. Over 160,000 tons of iron and steel were produced in 1910, over 180,000 tons in 1911, and 250,000 tons last year. It therefore follows that the net profit of the foundry has also increased. The profit amounted to Y.50,000 for 1911, increased to over Y.150,000 for last year, and is estimated to increase to Y. 4,000,000 this year. This increased profit is partly due to the activity of the iron market at home and abroad, and partly to the improved skill of the operatives and the perfection of the machinery and plant. The output of iron and steel this year cannot be ascertained as yet, but is estimated at no less than 200,000 tons, so the net profit is estimated at about Y.4,000,000.

RAILWAYS IN MALAYA

Construction Work on the Kedah Line

The history of most railways is a record of ups and downs, of fat years followed by lean, but the Federated Malay States Railways have enjoyed an unbroken series of successes. The policy of steady development has been followed and all construction work has been done departmentally. This policy has been adversely criticized, but looking at the results from a purely railway point of view it must be said that it has the sanction of success.

The report for 1912 was quite as satisfactory as those which preceded it. In this report Mr. P. A. Anthony, General Manager of the Federated Malay States Railways, says that the past year has been of unusual importance in the history of Railway development in the Peninsula, the Johore State Railway and the Singapore Government Railway having been included as from 1st January under the Federated Malay States Railways Administration. In consequence of this amalgamation a comparison with the earnings, expenditure and other statistics of the previous year is not easily made.

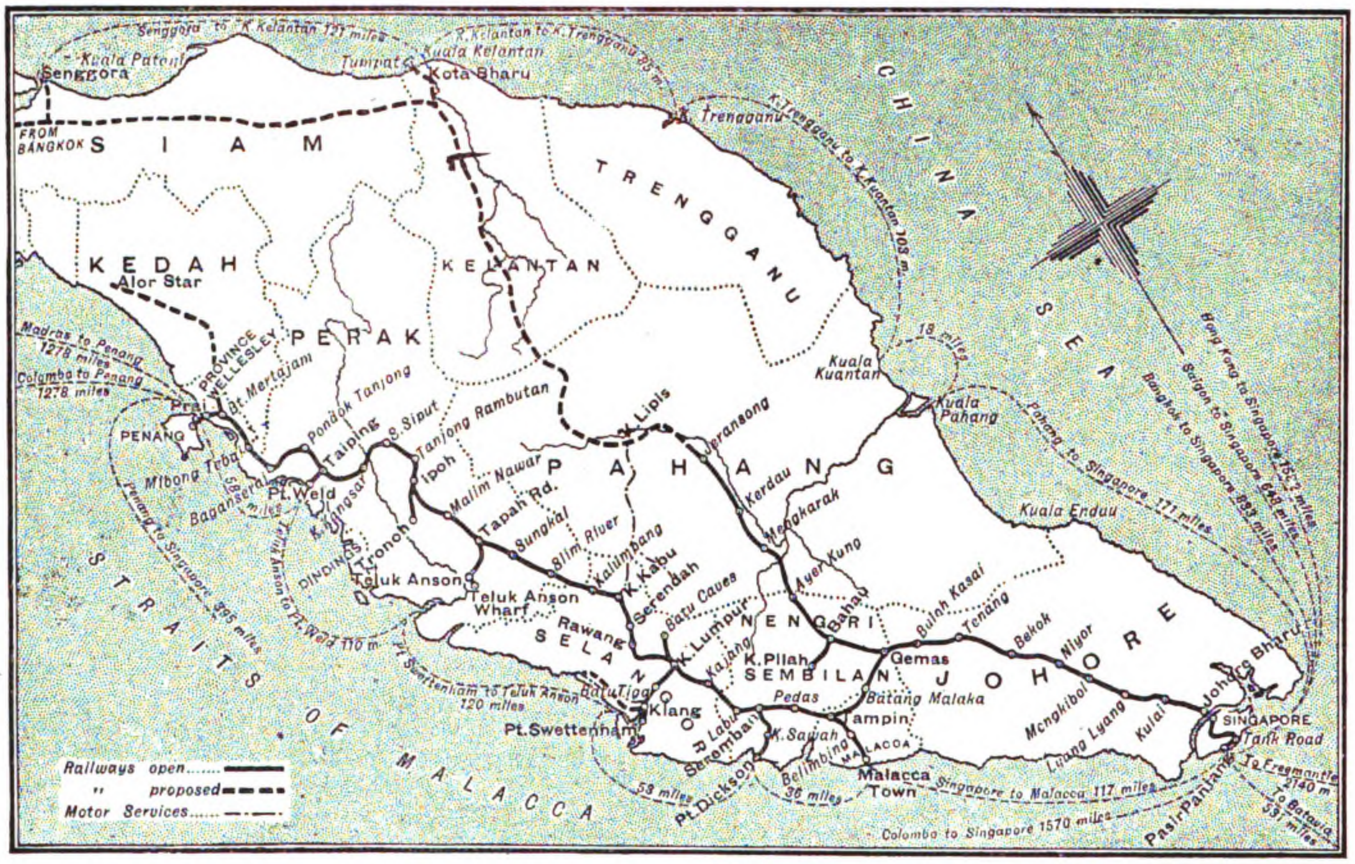
The dividend earned on a capital of $59,444,038.84 was 4.56 per cent. after paying the rents of leased lines, as compared with 6.03 per cent. Federated Malay States Railways only in 1911. Advantage was taken of a time of prosperity to carry out certain necessary improvements and additional accommodation at stations and to purchase additional locomotives as replacement of obsolete stock from revenue, the expenditure on this account showing an increase of $471,598.49 over 1911.

The constant rise in price of materials and labour contributed largely to the increase of working expenses, particularly in the Engineering Department, in which department also there was a large increase in sleeper renewals, an item which must be expected to increase with the age of the Railway.

The prosperity of the Railway has made it possible to give considerable reduction in fares and rates, of which the following are the principal items: Reduction of 1st class fare from 6 cents to 5 cents per mile; Reduction of 2nd class fare from 4 cents to 3 cents per mile; large reduction in parcel rates; reduction of rate on firewood; introduction of truck rates for constructional steel and iron work, corrugated iron, rubber cups in cases and crates, and to wooden cases or chests in parts for making up into rubber chests; reduction in long distance goods rates, all classes.

The very rapid trade development during the year, and which shows no sign of abatement, has taxed the resources of the department to their fullest extent and has necessitated very hard work on the part of the officers and staff. Large orders for rolling stock were placed in England during the year for delivery in 1913.

The total mileage of lines open for traffic including leased lines, on 31st December, 1912, was 734 miles 15 chains, an increase of 175 miles 13 chains. The length of sidings was increased by 1 mile 78 chains, making a total of 92 miles 23 chains and 826 miles 38 chains of railroad in operation.



Railways in Malaya, showing the line from Bukit Mertagam to Alor Star, now under construction

Expenditure

The total expenditure on account of special services on capital account during the year (exclusive of $64,471.36 spent on account of the Johore Line) amounted to $1,156,981.31; the principal items being:—

Additional Passenger Stock for Fast Service, Ipoh to Prai $106,668.35; additional Passenger Locomotives, Kuala Selangor Line, $108,727.68; one hundred new Goods Vehicles $128,245.39; new Station and Hotel, Ipoh, $125,248.13; additional Wharf Accommodation, Port Swettenham, $210,948.46; new Timber Tongkang Wharf, Port Swettenham $102,181.87; and twenty Bogie Coal Trucks $69,630.18. The above includes an item of $108,727.68 account locomotives for the Kuala Selangor Line not yet opened for traffic, the account is therefore transferred to "Capital Account Lines under Construction and Surveys."

The average capital cost per mile of line open on 31st December, 1912, was $99,333.04 as compared with $97,069.61 at the end of 1911. Special services on revenue account were responsible for an expenditure of $859,210.83 as against $387,612.34, an increase of $471,598.49. This is exclusive of a sum of $260,000, being amount paid in respect of rent of the Singapore and the Johore Lines for the twelve months.

Revenue

The gross earnings from all sources, including motor services, amounted to $8,421,016.87 as compared with $7,718,239.75 in 1911, after adding the earnings of the Johore and Singapore Railways for 1911, an increase of $702,777.12 or 9 per cent. Of this increase, passengers (including season tickets) are responsible for $373,805.10; goods and live stock, $368,659.73; parcels, etc., $18,035.38; horses, carriages and dogs, $2,467.90; and sundry receipts, $75,050.33; whilst there are decreases under headings, special trains, motor services and reimbursements of $126.91, $78,022.52 and $56,991.89, respectively. Compared with the sums estimated the earnings were as follows: Actual passengers, goods, etc., $8,421,016.87; estimated, $7,960,000; increase over estimate, $461,016.87. The earnings per mile of line open per week, exclusive of motor services, amounted to $223.26 as compared with $237.77 on the Federated Malay States Railways only in 1911. The earnings per train mile are as follows, including Singapore and Johore Railways earnings:—

	1912	1911.
Gross earnings per train mile ..	$2.61	$2.63
Expenditure	1.77	1.47
Net earnings	.84	1.16

Working Expenses

The gross working expenses for the year, including motor services and special services on revenue account, amounted to $5,754,671.64 as compared with $4,365,103.84, including Singapore and Johore Railways expenditure in 1911, an increase of $1,389,567.80.

WORKING RESULTS

The dividend earned by the open lines on a capital of $58,905,133.47 and a net profit of $2,691,748.80 works out at 4.56 per cent. as compared with 6.03 per cent. Federated Malay States Railways only in 1911 and 4.35 per cent. Federated Malay States Railways in 1910. The falling off in this respect as compared with 1911 is to be attributed to the increases of expenditure under special services on revenue account and annually recurrent expenditure and to the inclusion in the accounts of the less remunerative Singapore and Johore Lines.

The results of the year's working has been a loss of $72,390.66 as compared with $53,693.04 in 1911, $76,417.13 in 1910, $27,814.50 in 1909, and $26,873.25 in 1908, or a total loss since the commencement (after allowing for a profit of $8,725.45 in 1907) of $248,436.13. In the balance sheet the value of cars on 31st December, 1912, is shown as $29,748.65 as against an actual cost of $368,772.62, the difference of $339,023.97 having been written off by way of depreciation, which also shows the depreciation of $1,015.86 on machinery and furniture.

TRAFFIC

The total number of passengers carried during the year was 11,589,273 against 10,347,896 on the Federated Malay States Railways only in 1911, an increase of 1,240,377.

The Kedah Railway

The important line of rail between Bukit Mertajam and Alor Star, the capital of Kedah, is being pushed on with as rapidly as possible. A special correspondent of the *Pinang Gazette* has recently investigated the work both at the Bukit Mertajam and the Alor Star end, and we reproduce the following interesting extracts from his article:—

The chief engineering feat on the Kedah Railway now in course of construction is the throwing of a bridge across the Muda River, at a spot some 15 miles up stream, and about the same distance from Bukit Mertajam where the branch to Alor Star strikes off from the main Prai-Taiping line. When completed the bridge will be marked with the distinction of having the longest single span in Malaya, namely, 250 feet,—a record likely to be maintained until the proposed bridging of the Straits of Johore becomes an accomplished fact. The latter is an event to which no definite date can be assigned, whereas the erection of the Muda bridge is well advanced. The section of 15 miles as far as the bridge will be open for traffic in March next; and the whole 58 miles of line to Alor Star will be open in 1915.

THE START FROM BUKIT MERTAJAM

Some observant passengers by the through trains to and from Prai might have noticed a track branching off a short distance to the north-west of the Bukit Mertajam station, and disappearing through a fairly deep cutting made in the pinkish-white and laterite coloured formation common to the district. There is nothing to see of the beyond: a sharp curve obstructing the view of the line's continuation. A fellow-passenger better informed than the majority may venture the remark, pointing to the diverging line: "That's the start of the Kedah railway which goes on to Alor Star and later on will be the best route to Bangkok." But, there is little indication at Bukit Mertajam itself of the important project that is in progress. To learn what is being done in regard to the work of construction one must do as I did—take a run up the line.

INSPECTION CAR'S RECORD TRIP

By one of those curious chances that somehow happen in the experience of journalists an inspection carriage was making its first trip to rail head. It had made shorter excursions before, but on this occasion it got within less than a mile of the site of the new Muda bridge, travelling a distance of 14½ miles. In the earlier stages of the journey, it must be truthfully admitted, we had little cause for pride, being merely the tail end of a construction train, the open trucks containing a crowd of coolies going to their daily toil on the line. But towards the end of the trip we were not a mere adjunct to a train—we were *the* train and the novelty of the carriage, its new, spic and span appearance, attracted the rapt attention of the Malays—men, women and children, especially the latter. Several picturesque little family groups of lookers-on were passed, and padi growers in the fields made our advent an excuse for a rest from planting operations which are now in full swing in the district.

IMPRESSIONS BY THE WAY

To the resident in Malaya familiar with its vegetation and scenery there is little to differentiate the country through which the new line passes from other districts long served by the railway. The track runs through or skirts several well known rubber estates—Yarrak, Bukit Talong, Tasek Kluga, Bertam, &c., while adjoining a patch of forest reserve near the Kreh Station some Chinese are felling jungle and opening up land for rubber. Cocoanuts grow everywhere, tapioca seemed to be coming more in vogue and, in addition to sundry small clearings of low ground, there is quite a wide expanse of ground under padi near the river. The undulations do not seriously interfere with the line's easy grading, and the elevations of laterite, in varying stages of decomposition, that have had to be cut through have furnished excellent material for the embankments. The earth work has solidified splendidly, and the engineers have been lucky in finding at hand granite quarries for ballast, sand for binding and good clay for brick making.

MANY BRIDGES

The job has been no picnic, however, and in wet weather the aspect of affairs must be vastly different to what it is after a spell of comparative dryness, of which every advantage was being taken to push forward the work, especially the foundations and bridge abutments. Much of the line runs through low-lying and swampy ground. Its nature may be gathered from the fact that between Bukit Mertajam and the Muda River, a distance of 15 miles, there are no fewer than 54 bridges and culverts: 29 of these are completed, 19 are in progress and 6 have still to be undertaken. Up to the seventh mile practically all the bridges have been finished; the few uncompleted only need the trough flooring to be put in. At the 6th mile a bridge of two spans of 150 feet has yet to be erected over the Sungei Kulim. Over the Sungei Jarak, 3½ miles further on, is one of 150 feet, and at the 12th mile, Sungei Korok, another of 5 spans of 100 feet each. The earth works and cuttings are complete up to the 13th mile. There are 5 locomotives now at work on this section. 100 feet of land on either side is fenced off and reserved for the railway and 66 feet through cultivated areas.

CREEPY CRAWLS

We made capital speed to the first station, 4 miles out, Penanti, gaily bowling along a fine straight of 3 miles after getting away from the workshops at Bukit Mertajam. Up to seven miles, when Jorak station is reached, the same smooth and rapid progress could be maintained, the track having been nicely ballasted—an excellent piece of work on which the Inspector of Works, Mr. Grayshaw, is to be heartily congratulated. Further on "the special," much to my relief, made no attempt at record breaking. I must confess that the crossing of the temporary bridges and the crawl round the "diversions" were a bit nerve trying. To a novice the weird creaking of the scores of dry, piled up wooden sleepers, used for trestles to hold up the rails, sounded very ominous. The engine puffed and pushed us carefully and safely round the site of the proper bridges, but "diversion" struck me personally as rather a misnomer for the operation. It is an experience one soon gets accustomed to, however, and was certainly an unforgettable feature of the trip.

AT RAIL HEAD

At the 14½ mile from Bukit Mertajam we reached rail head and descended from the car at an open culvert, for a walk of less than a mile along an embankment on which coolies were pushing trollies with earth required to complete the track. Very shortly it was expected, all being well, the rails would be laid and the construction trains running right up to the site of the Muda bridge. After the earthwork is in order, rail laying proceeds at the rate of a third of a mile a day on the section Near where our "special" stopped is the site of Sungei Muda Station. The scene of the bridge building operations was easily recognised by the clouds of steam and smoke rising from the engines and pumps against the background of brown hills across the river.

THE ABUTMENTS

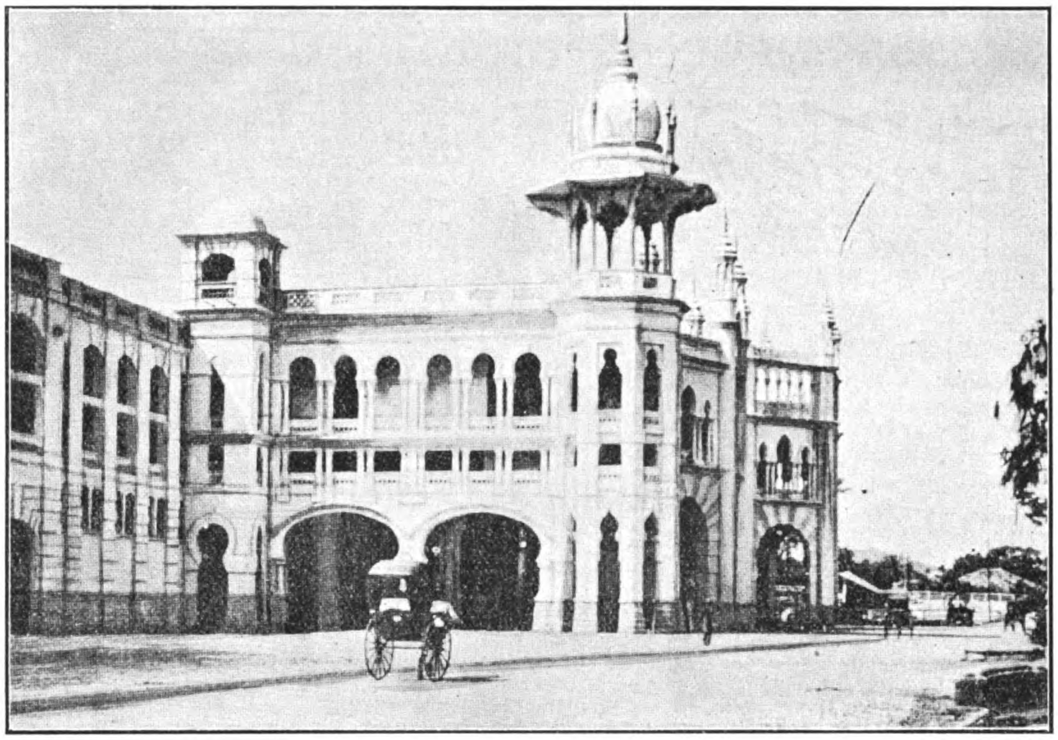
Mr. A. Shand, the section engineer, was engaged at the time of our arrival in examining the character of the stuff hoisted up from the interior depths of huge brick and cement cylinders which, when they have found their level and rest on a solid foundations, will be filled with concrete and form the bridge's abutments or piers. "37 feet down and still nothing but sand" was the report. 16 of these cylinders are being sunk (in pairs), 14 on the south and 2 on the north bank of the river; all the former 12 feet and the latter 15 feet in diameter. These thick cylinders are shod, so to speak, all round at the bottom with a strong pointed steel edge and their own weight, as the sand is continually being removed from the centre, causes them gradually to sink bodily and, as a rule, perfectly flush. Should a tendency to cant be detected, as was the case in one instance, the projecting side of the cylinder is heaped with bags of wet sand, and soon it settles down to an even level. This ingenious system of sinking cylinder well foundations originated, or at any rate has been successfully followed for very many years in India, where the science and practice of bridge-building has long been brought to a fine art.

A FINE BRIDGE.

The F. M. S. Railway engineers evidently mean to make a thorough and first-class job of the Muda bridge. It will be a record for Malaya, as its main span of 250 feet will far exceed the length of any existing single span bridges in this country. It will be of the lattice girder type and stand 22 feet above the river at low-water level. To carry the line above the floods which overflow the river's bank on the Province Wellesley side, the bridge has six more spans of 100 feet each, and it will consequently, counting the 250 span above the actual river and the abutments, be nearly 1,000 feet in length from the north abutment on the Kedah side to the furthest on the south or Province Wellesley side. When finished it should be a most imposing structure, and the temporary wooden bridge with 66 feet steel girders in position is a sight well worth seeing. It will be still more interesting when the big crane and other appliances are on the spot. The scene is a busy one, and the 250 men employed are kept steadily at work, the idea being to have the bridge erected six months hence. Tall lamp posts have been put up, and the work, if necessary, can be pushed forward by night as well as day.

A DEEP CUTTING.

This applies also to the deep cutting on which gangs of men are engaged immediately beyond the bridge on the Kedah side, the earth from which, as previously mentioned, is being trollied across to raise the three-quarters of a mile lead on the Province side. More than a hundred thousand cubic yards of stuff have yet to be removed and the cutting will be over 50 feet deep. Much of it is laterite rock which requires blasting. In this short bridge section, which extends from the 15½ mile to the 18th, there is the heaviest work on the line, but the progress already made indicates that it will be finished well within scheduled time.



FEDERATED MALAY STATES RAILWAYS.—The Station at Kuala Lumpur; portion of the building showing entrance to hotel

THE ENGINEERS.

This No. 3 section, of which Mr. Shand is now in charge, was previously in the care of Mr. H. Summerscale, who took over No. 1 (starting from Bukit Mertajam) from Mr. Highfield in May last and recently also assumed charge of No. 2 Section from Mr. Hall. The next section beyond that of the bridge, No. 4, takes in Sungei Patani Station at 21 miles, and is in charge of Mr. G. Lant. Then comes No. 5, Mr. R. P. Kittow, with Semiling Station at the 27th mile. Gurau Station at the 31st mile will be the getting off place for those who wish to make the ascent of Kedah peak. Goa 36 miles, Junun 40, Kobah 45, Tokai 49½, Penckulan Kindor 52, are the intermediate stations before reaching the terminus at Alor Star, 58 miles from Bukit Mertajam. On No. 6 construction section Mr. Boucher is in charge, and Nos. 7 and 8 are worked from Alor Star by Mr. Grieve. The keenest interest is taken in the work by the popular Chief of Construction, Mr. Fox, and the same may be said of the Acting Deputy Chief Resident Engineer, Mr. Cochrane, who made the survey for the line in September, 1911,

RAPID PROGRESS.

No time therefore has been lost, and it is remarkable what a lot of work has been done since construction started in July, 1912—just a year ago—on No. 1 section. Sections 2 and 3 were commenced in September; 4, 5 and 6 in November, and No. 8 in February of this year. As before mentioned, on No. 3 section there is a good deal of work ahead, and also on sections 6 and 7. But by 1915 the whole line will be open, and it is proposed to have trains running for ordinary traffic on the track through the Province to the Muda bridge as early as March next. By then, however, there will be no "diversions" to add a spice of excitement to the excursion.

As a consequence of the increased traffic that will come to Prai with the opening of the Kedah line, the track from Bukit Mertajam to Prai is being duplicated and the surveys for the double line have just been finished. Construction work, which includes the extending of a number of bridges and culverts, will be started almost immediately. Additional railway servants' quarters and other buildings will be put up at Prai. At Bukit Mertajam station another platform on the opposite side is to be constructed, with writing rooms. &c., and passengers will cross by an overhead footbridge. Alor Star, as is only fitting, will have very swagger station buildings with a tall clock tower in the centre.

THE WORKSHOPS AND STORES.

On returning I had an opportunity of looking over the stores and shops of the Railway Department spread along the sides of the line beyond the cutting at Bukit Mertajam. It was an object lesson in organization and foresight, and went far to explain the smooth and businesslike way in which the construction work has proceeded all along the line. Stocks of girders, sleepers, 60 lb. steel rails, fencing gate and signal posts, &c., were neatly arranged for easy loading at different spots, and in the work-shops, blacksmiths and carpenters were busy making various station furniture fittings, including desks, ticket cabinets, &c. The whole arrangement impressed one with a sense of efficiency and thoroughness. Another point that struck me was that although Indians of all kinds—Tamils, Malabars, Sikhs, Punjabis—as well as Chinese were greatly in evidence as workers; the Malays seemed content with the decidedly softer job of looking on. There have been not accidents of any seriousness on the section and the sickness among the labourers has only averaged 1 to 1½ per cent.

A BIG LABOUR FORCE

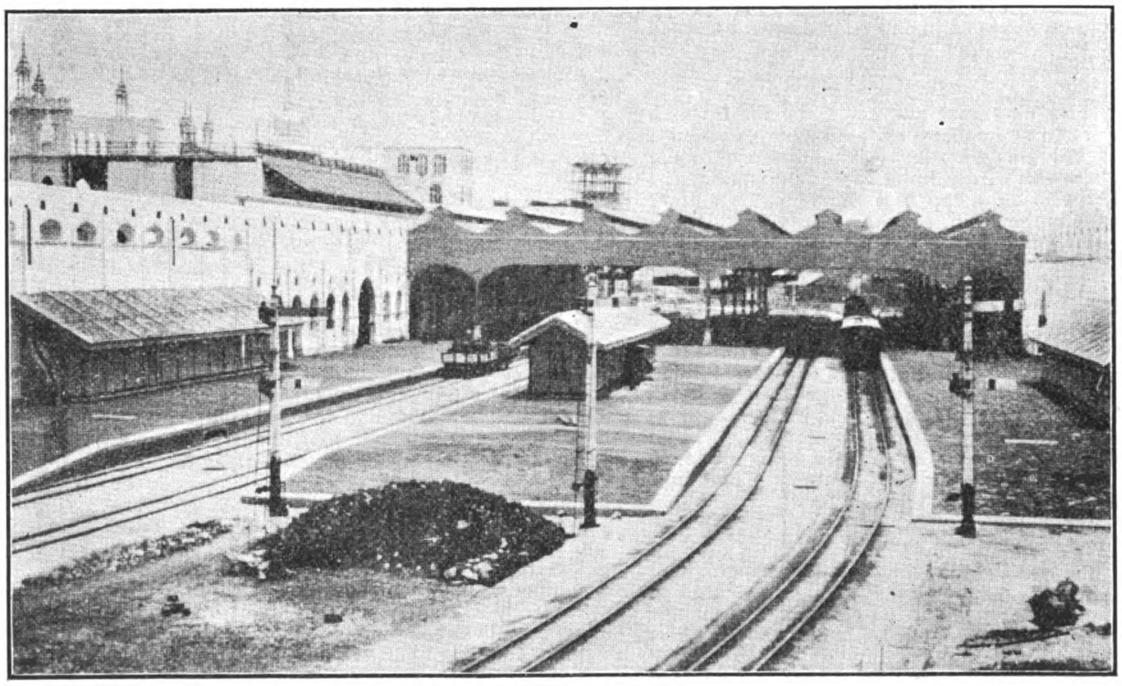
Between 2,000 and 3,000 labourers are now engaged on construction work along the whole line. In the early stages of the project, for jungle cutting and surveying, Malays were of some use; but the making of cuttings and embankments and the sinking of bridge foundations are not to their liking and they have returned to the more congenial and less arduous occupations of padi growing and chicken raising. All the same the whole district must share in the prosperity following on the circulation of many thousands of dollars monthly in wages and for locally produced materials, and the advent of the railway should mean the starting of a new era for Kedah.

The Work at Alor Star.

Describing his visit to Alor Star the correspondent says:—

About a mile down the cart road along the celebrated Wan Mal Canal is the Headquarters for the northern end of the Kedah Railway. Here are the bungalow of Mr. Thos. Grieve, Assistant Engineer, Railway Construction Department, F. M. S. Railways, the officer in immediate charge, and the offices and quarters for his staff, specially erected by the R. C. D.

Mr. Grieve conducted the correspondent through the premises of the Railway Construction Department, erected on the site of extensive



FEDERATED MALAY SATES RAILWAYS.—The Kuala Lumpur Station, showing Platforms.

padi fields, and over the line which is being laid. Unlike the Province section of the railway, which is connected with the F. M. S. Railway System at Bukit Mertajam, the branch of the F. M. S. Railway Construction Department at the Kedah end of the line has to depend on its base at Alor Star for its supplies, which have to come up by sea and river via Penang.

Alor Star Station.

Alor Star Railway Station is to be at the 56th mile from Bukit Mertajam, which is seven miles from Prai. It will be situated on the Langgar Road and about half a mile from the Government Offices. This thoroughfare is a road running in an easterly direction from Jalan Rajab, the thoroughfare connecting the large iron bridge over the Langgar River, passing the General Post Office and the Police Courts on the right and the Rest House on the left, and thence to the Balei Besar (Audience Hall) on the right.

Alor Star Railway Station, with its officials' quarters and the station yard, will occupy a space 450 feet wide and 2,500 feet (nearly half a mile) long, which is practically the whole distance between the Langgar Road and the Langgar River, over which there will be thrown a bridge of the same type and span as the large span bridge across the Muda River.

The station building will be 180 feet long, with a booking office, waiting and refreshment rooms and a clock tower 40 feet high in the centre. In addition to the quarters for the station master, guards, drivers, clerks, etc., there are a goods shed, carriage shed, engine shed and turn table.

Landing Stage

On the bank of the Langgar River opposite the Alor Star Station site is the Railway landing stage. A steam crane has been rigged up for unloading rails, sleepers, cement and other materials from tongkangs arriving from Penang. Sheds have been erected for the storing of cement and other material liable to be damaged by inclement weather, and an engine shed, workshop and quarters for staff and workmen.

A construction locomotive had recently been landed and the different parts were being fitted together. The engine would shortly be running, so that the laying of the rails can be carried out much faster and easier than has been possible hitherto when the trucks had to be pushed by hand.

The broken metal, which is of limestone, comes in prows from Gunong Geriang to the landing place by the Langgar River, where sand from Anak Bukit is also landed from similar craft.

The Langgar Bridge

The Langgar River will be spanned by a lattice girder bridge of 250 feet span, with a clear headway of six feet at high water spring tide for boats to pass under it. Each abutment will consist of two steel cylinders, lined with brick, nine feet in diameter. The soil inside each cylinder being excavated, the weight causes it to sink until a firm strata is reached, when the interior will be filled with cement concrete.

The line runs through very flat country—padi fields and swamps—liable to floods and at the time of writing inundated with one or two feet of water, while the embankment on which the permanent way is laid is on an average about three to four feet above the ground level. From a point about half a mile from the Langgar River, the railway runs in a dead straight and practically level line for 13 miles to the foot of Bukit Pinang, round which it curves through a shallow cutting, then runs straight again for another 3 miles to Junun, where there will be a station.

The embankment has been completed for a distance of eight miles, and the permanent way has been laid on two miles of it from the Alor Star end. The rest of the embankment is in progress, but the earth for this has to be taken from "barrow" pits, the work being delayed owing to the recent rains which have flooded the whole country.

Other Bridges

Other bridges of 40 and 60 feet spans will be built on brick well abutments, and smaller bridges and culverts will be built with concrete abutments on piled foundations. These cylinders will probably be sunk to about some 45 feet below the bed of the stream, or about 70 feet below ground level; the depth of water in the river at L. W. S. T. is 18 feet.

The next bridge of importance now in progress is over the Sungei Kundor. It is of 100 feet span, and the abutments are of brick wells in cement mortar, there are three in each abutment—one of 15 feet (external) diameter and two of 12 feet (external) diameter—with walls three feet thick and reinforced with 1¹ inch iron tie rods, and fitted with wrought iron shoes to cut into the soil. The progress of sinking is similar to that at Langgar river bridge.

The Railway Construction Department has also opened its own brickworks close by the line, and the kilns are capable of turning out 150,000 to 200,000 bricks of very superior quality every month.

Stations Mileage and Fares

The following is the list of the stations, with the mileage and passenger fares (calculated by the correspondent at the present scale of charges) from Buklt Mertajam :—

Station	Mileage	1st	2nd	3rd
		$ c.	$ c.	$ c.
Penanti	4	0.20	0.12	0.08
Jarak	7	0.35	0.21	0.14
Kreh	9	0.45	0.27	0.18
Sungei Muda	15	0.75	0.45	0.30
Sungei Patani	21	1.05	0.63	0.42
Semilling	27	1.35	0.81	0.54
Gurau	34	1.70	1.02	0.68
Goar Chempadak ...	36	1.80	1.08	0.72
Junun	39	1.95	1.17	0.78
Kobah	45	2.25	1.35	0.90
Tokai	49	2.45	1.47	0.98
Pengkalan Kundor ...	53	2.65	1.59	1.06
Alor Star	56	2.80	1.68	1.12

The passenger fares from Penang to Bukit Mertajam, for the first, second and third classes, are: 50, 30 and 19 cents respectively.

The distance by railway from Prai to Alor Star is 63 miles, and from Prai to Taiping is 60 miles, that is, three miles less. The journey from Penang to Taiping by the early morning ferry steamer and train, calling at sixteen stations, now takes 3 hours 43 minutes, while the through express service calling at seven stations does the trip in 2 hours 54 minutes. When the line is completed in 1915, it may be assumed that the trains will not be able at first to run at such a high speed as is possible on the old line to Taiping, but in any case it is safe to assume that the trip between Penang and Alor Star may be made in about five hours.

A Sanatorium is to be formed at Kedah Peak (3,878 feet), where bungalows are to be erected to accommodate two families. A bridle path is being constructed from the foot of that mountain near Gurau Railway Station to the plateau on which the bungalows are to be built, where there is said to be a good water supply.

FLOATING DOCK FOR SOURABAYA.

An Aden telegram, dated September 7, to the *Times of India, says:*—The floating dock *Sourabaya* arrived here on Thursday from Suez *en route* to Sourabaya, and is still in the Aden Harbour. This huge structure, which is towed by the tug boats *Atlas* and *Titan* left Nieuwediep, Holland, towards the end of June last and called at Algiers, Port Said, and Suez. She will probably proceed this week to Colombo and from there will go to Sabang, Singapore, Batavia, and Sourabaya, which last port should be reached in November. On the voyage out the average speed has been about three and half knots, the best day's run being a hundred and ten miles. The slowest speed attained was off Cape St. Vincent, when only 36 miles were covered in 24 hours. The voyage through the Suez Canal was accomplished more easily than was anticipated, despite the breakage of a mercury indicator, which occurred through the dock slightly touching the bank.

Owing to strikes in Holland the construction of the dock had been delayed a year, thus frustrating the very interesting original project. This was to place inside the present floating dock a small one built in America which was to be towed to Amsterdam, and inside this second dock a floating crane was to have been put, the whole arrangement being intended for the convenience of transport in Java. The dimensions of the *Sourabaya* are: length 140m. 93c; breadth, 35m. 06c; depth, 4m. 50c. and the lifting capacity is 14,000 tons. She embodies all the latest improvements and is fitted with four powerful winches as well as four anchors and chairs. She has sixty-six compartments of which forty-four are under water level, and her capstans are driven by three oil engines. The temporary steering gear and high pressure centrifugal pumps are worked electrically, the power being meantime supplied by a marine steam engine fitted on top of one of the sides. At her destination, power will be supplied to the motor by cables laid from the shore electrical installation. The engineers can see at a glance by the mercury indicators, and an arrangement of coloured electric lamps, both the height of water in each compartment, and whether the valves are open or shut; the possibility of accident or error is thus reduced to a minimum. A commodious house has been built for the crew. The tugs *Atlas* and *Titan* are fitted with wireless and Captain Baker is in charge of the whole affair. The tugs belong to the Amsterdam Tug and Salvage Company, which has carried out some remarkably long and difficult tows.

OIL IN JAPAN

The *Osaka Mainichi* reports that the demand for petroleum having largely increased in England for use as fuel by warships, the Rising Sun Petroleum Company finds it difficult to obtain the required supply of oil for the Oriental market, and the company appears as though it will have to allow its field in the East, opened at the cost of much labour and money, to be encroached upon by other companies. The company is reported to have opened negotiations with the Hoden Petroleum Company with which it is closely connected, to purchase the latter's oil.

Since the adoption of rotary machinery for working the wells, the daily output of oil of the Hoden Company has increased to about 600 koku, or 1,500 gallons. But the existing accommodation of the Company for refining oil is taxed to the utmost, and if the output increases any more, the oil must be stored in a crude form. It is reported that the Hoden Company intends to re-open its Hodogaya refinery, the working of which has been suspended for a long time, and it was expected the Hoden Company would willingly accept the offer of the Rising Sun Company to buy oil, but the negotiations still remain unsettled. The Osaka journal adds that since the result of the working of rotary machinery in Japan has proved successful, the Hoden and Nippon Petroleum Companies have been striving to find new wells, and new syndicates for working wells have been formed, so that the output of oil has greatly increased since last year. Even so, the total output of oil in Japan is less than half the demand. If the output increases at the present rate, however, the importation of petroleum will be "entirely checked," but that day is still far distant. For the present, the difficulties of the Japanese companies in disposing of their oil will increase as the output of oil increases, as foreign oil is coming into the country in such large quantities.

AN INLAND CRUISE IN A TWENTY-FOOTER

By S. E. Brown

An interesting trip that was first planned to be a 4,000 mile cruise has just been made by Mr. and Mrs. E. J. Camp of Union Pier, Mich.

Mr. Camp is an old Chicago contractor, who for the past nine or ten years has spent the greater portion of his time at Union Pier, a small summer resort between New Buffalo and Michigan City. He is still engaged in the contracting business, so the "Claudia M.", a 20-foot, flat bottomed boat, was not given out to a boat builder, but was built by Mr. Camp himself. The trip that was made led across the southern end of Lake Michigan to the Wells Street bridge pier in the Chicago river, and from there down the drainage canal to Lockport. From there the old canal was followed to La Salle. The remaining 250 miles to St. Louis, was made by way of the Illinois and Mississippi rivers. The original plan was to proceed by way of the Mississippi to New Orleans, then follow inland routes and the gulf to Key West. Unfortunately, Mrs. Camp became ill on reaching St. Louis—therefore, the long trip had to be given up.

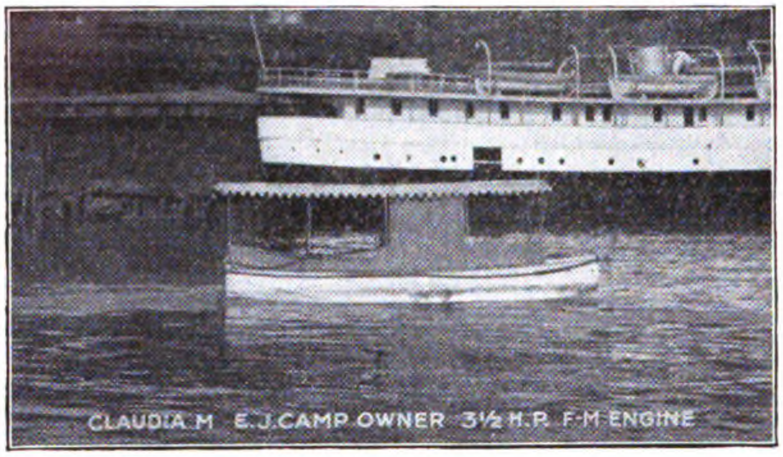
The "Claudia M," owned by E. J. Camp.

Mr. Camp's experience with southern waters and his intention of making a long trip, led to his building a shallow, flat bottomed boat, especially adapted to river travel. His craft measures 20 feet in length by 5 feet 8" beam, is 28" deep and draws but 8" of water. Owing to the absence of a harbor at Union Pier, which makes it necessary to beach the boats, the "Claudia M." is of especially strong construction. A 4" by 6" white oak timber extends along the bottom. Heavy 6" white oak planks are also screwed on the bottom to facilitate pulling up on the rollers. A 1" rope passes around the entire boat and ends in a heavy iron ring at the front; this scheme prevents the heavy strain in beaching, causing damage. The bottom proper is of 1 1/8" fir soaked in boiled oil. The battens on the side are 3" x 4" white oak. The planking of the boat is cypress. The rail and top finish is oak. Gas pipe uprights carry a heavy canvass covering arranged with side curtains to afford protection from wind and rain.

Crossing Lake Michigan, really gave a very thorough test of what his little boat would do. Mr. Camp left Union Pier at 7 o'clock on the morning of October 2nd, and reached the Wells Street Bridge pier in the Chicago river at 8.35, in the evening. The 55 mile trip was made against a strong head wind and heavy sea, so that the time was remarkably good, considering that the power for the "Claudia M." was furnished by a single cylinder, 3½ H. P. Fairbanks-Morse Engine. Mr. Camp had a chart of the southern part of the lake and steered his course by a pocket compass. He carried one passenger—a Boston Terrier—"Troubles." Mrs. Camp making the trip to Chicago by rail.

The arrangement of Mr. Camp's little boat is rather interesting. A gasoline range with the necessary accessories, and a trunk that serves as a work table, comprise the galley and dining room equipment—unless one includes a pine box, covering the engine, which answers at meal times to the name of dining table. The sleeping space measures 6' 4" in length, extending from the engine to the extreme stern of the boat. The design made famous by Mr. Pullman was followed. It being so arranged that boards could be shoved into place, thus making the entire rear of the boat a berth. An ample supply of rugs and cushions, together with something like a score of blankets, make the bedroom a very comfortable quarter, indeed. The boat was pretty well provisioned before leaving Union Pier; having been stocked with several bushels each of potatoes, pears, apples, etc., together with a crate of 2 dozen live chickens. Before leaving Chicago, the larder contained enough for 2 months of travel.

Mr. and Mrs. Camp were delighted with the voyage from Chicago to St. Louis, and greatly disappointed in being prevented from making the Key West trip.



The "Claudia M" leaving Chicago

After reading a description of the "Claudia M.", one naturally wonders why an engine of so small size was selected for so heavy a boat. In explanation, Mr. Camp stated that he had spent two winters in Florida and there frequently made fishing trips out in the gulf. All the boats he saw there were driven by Fairbanks-Morse engines and very frequently a 3½ H. P. was all that was used. The first three or four times he found himself 40 miles out in the gulf with one of these little engines as the only means of getting back to land, he doubted somewhat the judgment of the boat owners, but events proved that those old sea captains down on the Gulf knew what they were about. In many instances engines that had seen 14 years of service were still on the job, and as their owners declared "Ready to push the old boat anywhere if you give her the gas." The reliability and sturdiness of these engines so impressed Mr. Camp that when it came to a personal selection, one of them was ordered, lagged solidly to the foundation, covered with a neat pine box and hitched to the propeller.

The trip across Lake Michigan was made without the engine losing a shot. In fact, no engine trouble at all developed at any time during the trip.

The capacity of the gasoline tank is 12 gallons, and for the 55-mile trip across the lake only half this amount was required, despite the speed at which the boat crossed, and the constant head winds encountered.

MOTOR TRAFFIC IN MANCHURIA

The Fakumen (Manchuria) correspondent of the *North China Daily News* wrote on October 6th:—At the request of the Mukden Provincial Assembly, the Chamber of Commerce of Fakumen yesterday evening met to discuss a novel proposal. It was nothing less than the formation of a public company for conducting motor traffic between Mukden and Taonanfu, via Fakumen and Chengchiatun (Liaoyuanchow).

Owing to the activity of General Wu, of Chengchiatun, the successful commander of the Taonanfu expedition against the Mongols last year, the capital required for the northern section, Chengchiatun to Taonanfu, has already been fully promised. The General himself is subscribing one-half of the capital or $50,000. For the northern section, which though longer is more level than the southern section, an amount of $100,000 is considered sufficient to finance the scheme.

For the southern section, Mukden to Chengchiatun, though a larger capital than $100,000 is believed to be required, the present proposal is concerned with raising only this amount. Mukden guarantees one-half. It remains to be seen whether the other half, i.e., $50,000, will be forthcoming from Fakumen and the neighbourhood.

A Single Day's Run

The scheme sounds quite simple. It has the additional attraction of being of the very newest type. Briefly, the project is to repair the existing cart track with clay or other soil in such a way that automobiles will be able to perform the run of 130 miles from Mukden to Chengchiatun in one day. About a score of cars, each with a carrying capacity of some 2,000 lb. would be procured for the section. Thorny little problems, like that of wet weather, can be deferred for future consideration. The Liao River has to be crossed at a fairly broad spot between here and Mukden. On account of the expense, the idea of bridging the river is not being entertained. The motor cars would therefore be ferried across.

Must Japan Be Consulted?

The Chamber of Commerce was favourably impressed with the proposal. Provided subsequent information is satisfactory, money will be readily obtainable. For the present a reply is being sent to headquarters asking for further details and specially inquiring whether or not it will be necessary to consult Japan. General Wu holds that from the military point of view the scheme is advantageous for the administration of the districts of Inner Mongolia adjacent to Manchuria; the motor-road affording a speedy means of transit for troops to Taonanfu in time of war. At other times peaceful traffic would offer a prospect of gain to the shareholders in the company.

FAR EASTERN RAILWAYS

CHINA

Chengtu-Sianfu Railway.—Hu Chin-yi, Tutuh of Szechuan, considers that the construction of a railway from Chengtu to Sianfu is absolutely necessary, and has addressed a memorandum to the Ministry of Communications, stating his reasons. The Ministry agrees with him, and has informed the Szechuan Tutuh that it would insert an item covering the necessary expenditures for this new project in the Budget.

Pukow-Sinyangchow Railway Loan.—The Lower House has passed the agreement for the Pukow-Sinyangchow Railway Loan. The Bill then went before the Senate for approval. The Government delegate made his report. He explained that the present agreement was based upon a preliminary agreement signed during 1898. "The Pukow Sinyang Railway is one of the concessions demanded by the British merchants," said the Government delegate. "The Tsungli Yamen of the Ching Dynasty instructed the Chinese Railway Company to draw up a preliminary agreement with the British Corporation. It was stipulated that the line should start from Pukow of Kiangsu and pass through Anhui to Sinyangchow of Honan. The draft of this final agreement was drawn up soon after the conclusion of the Quintuple Loan. The bill was referred to the House of Representatives and was passed by the body. I hope this House will do likewise, so that work on the said railway can be carried out at an early date."

The members said that the bill should be referred to an examination committee. The Speaker said that it should be examined by the Financial Committee, but as no such committee was in existence, it would be advisable to wait until the committee was formed.

On October 29th the Senate finally passed the Bill.

The Chekiang Railway.—The Shaoshing correspondent of the *North-China Daily News* telegraphed on October 28th that he had been informed that the German firm of Messrs. Siemssen & Co. has obtained the contract for building the most important bridge on the Ningpo-Shaoshing section of the Chekiang railway. The bridge will be about 600 feet long and will span the Dzaongo river. The contract price is stated to be Tls. 268,000. The work is to be completed in eighteen months.

Proposed Lines.—A Peking telegram of October 16, states that Peking vernacular papers have recently published several conflicting references to impending German railway contracts. There is reason to believe, however, the telegram continues, that negotiations have been hitherto confined to a suggested revival of the old Ichow-Kiaochou line, which would join the Tsinanfu-Tsingtau line at Kaomi with an extension beyond Ichow in the Tientsin-Pukow line which it would reach at Hanchuang (near the Shantung-Kiangsu border.) It is understood that the Germans make the construction of a line from Chefoo to Weihsien contingent on the other scheme, but German capital would be available for the Chefoo-Weihsien line with Chinese construction if the Ichow line goes through. It appears probable that the construction of both lines will begin at a comparatively early date.

Another Belgian Railway.—A telegram from Yunnanfu, dated September 29, states that a Belgian group has obtained Peking's sanction to construct a railway from Posehting in Kwangsi to Yunnanfu. Their representatives arriving that week.

Tientsin-Pukow Line.—Notice has been given by the management of the Tientsin-Pukow line (Chinese Government railways) of an alteration in the express service which will be enforced on and after December 1. From this date the service will be operated only once a week from each terminal.—Saturdays from Tientsin and Mondays from Pukow. The other two trains—from Tientsin on Wednesdays and Pukow on Fridays—will be withdrawn for want of passenger stock to attend upon the change of timings for suitable connections with other railways. The timings for through mail trains will remain unaltered.

Under the new schedule, the down express will leave Tientsin East at 11.25 a.m. on Saturdays, arriving at Tsinanfu at 8.12 p.m. and Pukow 1.13 p.m. on Sundays. The up train will clear Pukow at 1.45 p m. on Mondays, making Tsinanfu at 6.40 a.m. on Tuesdays and Tientsin East at 3.51 p.m.

These expresses are timed to connect at Tientsin East with the Siberian train de luxe to and from Siberia and at Tientsin Central with the mail trains to and from Peking; at Tsinanfu with the express trains of Schangtung-Eisenbahn to and from Tsingtau and at Nanking with the special day express of the Shanghai-Nanking railway to and from the port.

Peking-Hankow Railway.—Extensive changes are to be made in the train services on the Peking-Hankow railway on November 1st. Not only will the time for the journeys be shortened with fewer stoppages, but more trains are to be put on the railway. No change is to be made in the express trains, which leave Hankow on Friday evenings and Peking on Mondays, except that the arrivals will be a little earlier.

In the semi-direct trains all stoppages at small stations have been cancelled, and this will ensure arrivals to time while it does away with the annoyance to passengers of an early start. The times of departures of these are from Hankow every day at 9 o'clock in the morning, which will reach Peking the day after at 5.10 in the evening. The train from Peking will leave at 9.10 every morning and will arrive in Hankow the following day at 5.35.

As the semi-direct will now only stop at large stations a new service of slow trains will be run. These will stop at every station and not run at night. They will take three days on the journey from terminus to terminus The times of departure and arrival of these new trains at the larger stations fit in with the semi-direct express so that passengers coming from or going to small stations can connect with the faster train. The three stages run by the slow train are as follows: first day Peking to Shun-e-fu, second day from Shun-e-fu to Yengcheng-hsien and third day from Yengcheng-hsien to Hankow.

No great change has been made in the trains running between Peking and Paoting fu, Peking and Shiehiachuang, and Peking and Chuanghsintien, except that the times of the trains have been slightly altered.

A few new stations which have been completed and are now ready for passenger service have been added to the new time table. A further notice will be issued later in connection with those not yet finished. No alteration is to be made about luggage, dining cars, luncheon cars, and sleeping cars service, all of which will be run as formerly.

Transfer of Officials.—The *Peking Daily News* reports that the Ministry of Communications has issued instructions to the railway authorities on the transfer of employees from one line to another. The despatch reads as follows:—

"The Chinese railway enterprise is in its infancy, and the first railway was built only a little over ten years ago. In the early period of the railway development, there is a lack of experts. When a new line is to be built, it often happens that the director of the line employs engineers who are working on an old line. This manner of transfer of men from one line to another results in depriving the old line of capable engineers to look after its affairs. Moreover the employees frequently contrive to secure a transfer for better pay. In the interest of the different railways in this country, we hereby issue the following regulations.

(1) Before making a transfer of any member of the railway staff, the directors of the two lines concerned must consider such a transfer carefully and the vacancy occasioned by the change must be filled up beforehand.

(2) In making a transfer affecting members of and above the second class, the directors must secure permission from the Ministry of Communications.

(3) Any member of the railway staff who resigns a post in order to take up a better position on another line shall be dismissed and debarred from again entering the Government railway service.

In view of the scarcity of well-trained men for the construction of railways, the directors of the different railways are hereby instructed to pay great attention to the training of competent engineers.

Russian Railways in China.—The Paris *Temps* learnt from St. Petersburg that there was to be a conference at Paris in the last days of October between Mr. Pichon, Minister of Foreign Affairs, Mr. Delcassé, French Ambassador to St. Petersburg, and Messrs. Kokoffzoff and Ssassonoff, Russian Ministers, when amongst others the question of loans for Russian railways in China were to be discussed.

Railway Concessions in China.—The *Japan Daily Mail* states that Russia is reported to be asking the Peking Government for the right to lay a railway connecting Tsitsihar with Taonanfu in Inner Mongolia and another starting at Tuitsingshan in the vicinity of Harbin and joining the Amur Railway at Aigun. Germany is also said to be pressing China to accede to the extension of the Shantung Railway to Honan Province. In the meantime Britain has already obtained the right to lay a railway connecting Chungking with Lanchow, while Japan is negotiating for the right of laying a railway connecting Haiyuan in South Manchuria with Taonanfu in Inner Mongolia and another connecting Haiyuan with Hailung, to the south of Kirin. With regard to Japan's claim, it is rumoured that it embodied the mysterious demand made in regard to the Nanking affair, about which something was heard when reports of the demands appeared in the papers.

The Lotung Railway.—The Lotung Railway has now been transferred from private ownership into Government control, and the Government is earnestly considering the construction of this line. The old staff of the railway will be retained and work on the railway will be started very soon. It is expected that the construction work on this line will be finished within one year.

Nationalization of Tungpu Railway.—Inspired by the success of the nationalization of the Hunan Railway, the Ministry of Communications is contemplating to transfer the Tungpu Railway of Shansi under State management, and to incorporate the line in a big trunk system. The Tungpu Railway Company has been in existence for several years, but no progress has been made in the construction of the railway. This line runs from Tatungfu in Northern Shansi to Puchowfu in the extreme south of the Province, passing

through Taiyuanfu, Fengchow, Hwochow and Pingyangfu. The process of nationalization of this line will be similar to that of the Hunan Railway.—*Peking Daily News.*

A Japanese Concession.—A Reuter telegram tates that according to the vernacular press Japan is seeking a concession for a railway from Foochow westwards to connect with the Hankow-Canton Railway.

Yuet-Han Railway Loan.—It is stated that the Yuet-Han Railway Company has contracted a loan of $1,000,000 to assist it out of financial difficulties. One half the amount was required, it is stated, to pay obligations up to October 1, and the balance is necessary to pay for the materials. The loan has been arranged with the Hongkong and Shanghai Banking Corporation, the security being the line itself. One important result of the transaction is an agreement to connect the railway from Kowloon to Canton with the line being built by the Yuet-Han Company, which will be the southern section of the trunk line from Hankow. It will connect with the northern section of the Hukuang line at the frontier of Hunan.

The Lung-Tsing-U-Hai Line.—The search for a seaport for the terminus of the Belgian line now under construction between Lanchowfu, the capital of Kansu province, and the sea, has ended, it is reported, in the entire abandonment of the original idea to adopt Haichow as a harbor. As was pointed out in the *Far Eastern Review* of April last in a description of this line, no port could possibly be selected between Tsingtao and the Yangtsze river owing to the vast quantities of silt deposited on the coast by the Yellow River. We then gave a summary of the reconnaissance made by Mr. A. J. H. Charignon, Adviser to the Managing-Director of the railway, which indicated that the port of Haimen was the most suitable for the purpose, having distinct advantages in several ways. There is an excellent harbor there which can be readily made suitable for deep sea ships, and further it is on the Yangtsze River.

To bring the line to this point the location from Tsingkiang-pu would be through the towns of Fowning, Yencheng, Tungtai, Haian, Jukao and Nan-tun-gchow, and the length would be increased by over 100 miles. More important than that, though, is the fact that this line would secure a terminus on the Yangtsze between Pukow—the riverine terminal of the railway from Tientsin,—and Shanghai; the distance from the latter port being about 60 miles.

Kowloon-Canton Railway.—The earnings in 1914 of the main and branch lines of the Kowloon-Canton Railway are estimated at $372,600, or $53,000 more than the amount approved for 1913, said the Acting Governor of Hongkong in his budget speech on Oct. 9. The unrest which has prevailed in South China during the current year has seriously interfered with the normal development of traffic, and until more settled conditions are established any considerable advance in earnings cannot be expected. Working expenses are estimated at $271,209, an increase of $14,810 over the amount approved for 1913, which is entirely due to expenses incidental to an increased train service.

Expenditure on all accounts is estimated at $841,864 and receipts at $372,600 for next year's working, leaving a deficit to be met from General Revenue of $469,264.

SHANGHAI-NANKING RAILWAY

The following figures of traffic returns (approximately) for the week ended September 20 are issued by the Shanghai-Nanking Railway:—

Year.	Passengers.	Goods and Sundries.	Total for the week.
	$	$	$
1913	47,991	9,046	57,037
1912	38,850	10,877	49,727
Increase.	9,141	—	7,310
Decrease	—	1,831	—

For thirty-seven weeks.

Year.	Passengers.	Goods and Sundries	Total
	$	$	$
1913	1,681,476	363,441	2,044,917
1912	1,646,247	282,202	1,928,267
Increase.	35,229	81,421	116,650
Decrease	—	—	—

Week ended September 27.

Year.	Passengers.	Goods and Sundries	Total for the week.
	$	$	$
1913	55,257	10,838	66,095
1912	24,572	9,201	51,773
Increase.	12,685	1,637	14,322
Decrease	—	—	—

For thirty-eight weeks.

Year.	Passengers.	Goods and Sundries	Total
	$	$	$
1913	1,736,733	374,279	2,111,012
1912	1,688,819	291,221	1,980,040
Increase	48,914	83,058	130,972
Decrease	—	—	—

Week ended October 4.

Year.	Passengers.	Goods and Sundries.	Total for the week.
	$	$	$
1913....	55,911	9,132	65,043
1912....	43,443	10,523	53,966
Increase.	12,468	—	11,077
Decrease	—	1,391	—

For thirty-nine weeks.

Year.	Passengers.	Goods and Sundries.	Total.
	$	$	$
1913....	1,792,644	383,411	2,176,055
1912....	1,732,262	301,744	2,034,006
Increase.	60,382	81,667	142,049
Decrease	—	—	—

Week ended October 11.

Year.	Passengers.	Goods and Sundries	Total for the week.
	$	$	$
1913....	58,639	10,798	69,437
1912....	42,102	9,685	51,787
Increase.	16,537	1,113	17,650
Decrease	—	—	—

For forty weeks.

Year.	Passengers.	Goods and Sundries.	Total
	$	$	$
1913....	1,851,283	394,209	2,245,492
1912....	1,774,364	311,429	2,085,793
Increase.	76,929	82,780	159,699
Decrease	—	—	—

JAPAN

Tokyo-Yokohama Line.—A Tokyo paper reports as follows, under date September 27:—The electrification of the line between Tokyo and Yokohama on the Government railways is progressing rapidly. The work, which was started last summer, consisted in the widening of the line so as to allow of four tracks being laid, two for the electric cars and two for the trains. This also necessitated the alteration of some of the stations, while, of course, the excavation work, some of which is not yet finished, occupied some time. The work was at first expected to be completed by next May, but October is now given as the probable date; the construction of the power plant, which is situated at Kamata, taking longer than was thought. It may be noted that the electric power is to be generated from gas, on the latest and most improved methods, experience showing that owing to the bye-products obtained this method of generating electricity is the most economical. It is interesting to note that gas, while driven from the field as an illuminant, except apparently on the Midland Railway in England, is having its revenge as the generator of its rival. The construction of its own power plant will enable the line to be independent. The power used on the present line running from Gofukubashi to Shinagawa and beyond is supplied by a private company.

The cars will start from the Central Station and will run to the reclaimed ground at Yokohama, crossing the railway line at Namamugi by means of an elevated track. Fifty cars will be run on the line made up into trains of two or three cars each, and second and third class carriages will be provided.

Yokkaichi Railway.—The Yokkaichi Railway between Suwa and Kawashima in Mie Prefecture, 3.4 miles in length, was opened for traffic recently.

State Railway Receipts.—The total amount of fares received by the Government railways throughout Japan during the first half of the current fiscal year, viz. from April until September, was 29,200,114 yen, an increase of 2,293,980 yen compared with the same period of last year, while freights amounted to 26,636,594 yen, which shows an increase of 1,766,086 yen. Thus the total amount of fares and freights was 55,841,604 yen, an increase of 3,060,066 yen compared with the same period of last year. This total means an increase of 2,254,111 yen compared with 53,587,493 yen, which is the estimated receipts during the first half year. The receipts during the second half fiscal year being expected to show an increase, the aggregate total this year will exceed 110,000,000 yen.

Improvement and Extension Fund.—A Tokyo paper reports that the authorities in the Japanese Railway Board state that the estimated expenditure for the improvement and extension of the railways, the scheme for which is spread over a period of eleven years from next year, amounts to something like 162,870,000 *yen*. Of this 95,460,000 *yen* is set aside for the purpose of extension, and 67,410,000 *yen* for the improvement of railways. According to the law for the Railway Special Account, the above funds ought to be raised by means of public loans, but influenced by the Government's financial policy during the past few years, as well as the conditions of the money market at home and abroad, the Railway authorities have been obliged to turn to the Deposit Bureau in the Finance Department, so far as the deficit in the funds outside the amount covered by the railway proceeds is concerned.

The advance capacity of the Deposits Bureau, however, has been of late considerably limited, the deposits in the postal savings bank, which constitute the bulk of the Bureau's financial resources, not by any means showing a reassuring tendency since last year. The authorities therefore raised a foreign loan in March this year to the amount of one hundred million *yen* in order to appropriate it for the redemption of the short term domestic railway bonds as well as the partial payment of the debts the Railway Board owed to the Deposits Bureau. This railway loan raised abroad, therefore, has only served to partially redeem the domestic railway bonds, and how to obtain the Railway funds required for the next and succeeding fiscal years still remains a question. Some time ago the Financial Affairs Committee of the Seiyukai made public what they claimed ought to be the Empire's future railway policy. This, however, was a plan formulated on the basis of party politics, and could hardly be applied to the actual policy of railway administration. The general belief among the authorities, in these circumstances, is that the Government should do away with the means hitherto pursued in raising the railway funds, and establish a definite policy of depending on foreign loans

to cover any deficit in the funds not met by the proceeds from the railways so far as the next five or seven years is concerned, although the expenditure for the extension and improvement of the railways should be defrayed in accordance with the annual actual necessity subject to determination by the capacity for railway construction. The annual expenditure for railway construction and improvement will therefore scarcely exceed forty million *yen*.

Railway Sleepers.—On the State railways 2,340 sleepers are laid for every mile of track, so that the number of sleepers used in the 5,305 miles of the Government railways reach a total of 12,313,700. Chestnut wood is chiefly used for making the sleepers, and the usual price paid by the Railway Board is 60 *sen* a sleeper. The sleepers on the State railways thus cost in round figures 738,822,000 *yen*. Under ordinary conditions they last six years. At present some 200,000 are replaced every year at a cost of 12,310,000 *yen*. The extension of the lines has caused a scarcity of chestnut wood and a corresponding increase in price, and it is thought that in present circumstances it will not be long before the Railway Board will have to turn to the use of some other kind of wood. The Department of Agriculture and Commerce has undertaken the plantation of chestnut trees, but the supply still remains far short of the demand, and the Railway Board is said to have in view the planting of chestnut trees on its own account.

Freight Cars Insufficient.—Insufficiency of freight cars is felt at present owing to the great increase of goods to be carried. In the district under the control of the Kobe Railway Division, 50,000 tons of goods are daily received for transportation, but there exists the carrying capacity for only 2,500 tons. In the Hokuriku districts there were frequent railway interruptions owing to the floods. The opening of the Toyama Industrial Exhibition rendered the railway traffic busy in Toyama district. The failure of the rice crop in the North Eastern districts necessitated the despatch of freight cars to that region for the transportation of foreign rice. These circumstances made the insufficiency of freight cars more keenly felt than ever. The Railway Board is now making new cars to fill the want.

Nakai Railway Dividend.—The Directors of the Nakai Railway Company have decided to declare a dividend of 8½ per cent. per annum. The Hanshin Electric Railway Company will declare a dividend of 6½ per cent. per annum.

Toshin Light Railway.—The newly projected Toshin Light Railway Company which has obtained official permission for its establishment, proposes to build a line from Komoro, Sakugun, Shinshu, to Nakagome-mura, Minami-Sakugun, a distance of 8 miles, with a capital of 250,000 yen. The company has opened offices at No. 1, Kotohiracho, Shiba.

MANCHURIA

South Manchuria Railway.—The S. M. R. Traffic Returns for the month of September give the total of Y1,359,425 and the daily average of Y45,314, being an increase of Y11,444 a day. The aggregated traffic receipts since last April up to the end of September, forming the first half of the current fiscal year, reached Y9,218,939, being an increase by Y2,164,295 on the corresponding period of last year.

The S.M.R. Co. has decided to attach second-class sleeping cars to the South Manchuria express trains between Dalny and Changchun, and also to the Manchuria-Korea express trains between Changchun and Fusan. The second-class sleeping cars are now in course of construction at the Railway Workshops at Shahokou and will be completed by the end of October. They will come into actual service on November 1st. With the introduction of the second-class sleeping cars the use of the first-class day cars, hitherto attached to each express train, will be discontinued. An express train on the S. M. R. line will thereafter be composed of first and second-class sleeping cars and dining car.

The new shares of the South Manuchuria Railway Company—just issued to the number of 20,000—have been allotted to shareholders at the rate of one for each old share held, and the first instalment of payment was called up on September 1. The money market, however, is tight, and even loans on the best approved security have to bear an interest charge at the rate of over 8 per cent., while not more than 80 per cent. of the market value of securities is advanced. Consequently, we learn from the *Asahi*, many people find it difficult to take up their shares, and they are already being offered for sale. The probable dividend is not more than 6 per cent., and old shares, Y.165 paid-up, have gone down to Y.148 or so, while new shares Y.20 paid-up, are quoted at about Y.10.50. The payment called on the new shares has been unsatisfactory, and the time allowed for payment has expired, but the Company refrains from issuing demand notes. It is learnt that the Company has deferred calling up payment of the last instalment of the old shares, drawing the money required from the reserve fund instead.

The S. M. Railway Workshops, Shahokou, received from the Chosen Railway Administration an order for 26 cars, of which 16 will be completed by the end of next March and the remainder two months later. This is said to be the first construction order given by an outsider.

A report from Dairen states that in view of the strong opposition of the shareholders to respond to any calls made by the South Manchuria Railway Company before Government accedes to their demand to raise the rate of dividends on the ordinary shares, the directors have decided to abandon the plan of making a call on the old shares as was proposed. The amount of 4,000,000 *yen*, which is the present deficit on the working capital, and which was to be made good by further calls on the original shareholders, will be met by short-term loans in the meantime.

The frequent conflicts with the police within the South Manchuria Railway districts is a matter to be deplored in view of the friction it causes in Sino-Japanese relations. The trouble seems to be due to the absence of a clear delimitation of the boundaries, and it is feared if things are left as they are now, the consequence will be the repeated outbreak of troubles of a more serious nature, inasmuch as Japan is going to extend the South Manchuria Railway in the future. With these considerations in view and in order to nip all future troubles in the bud, the Japanese Government, after conference with the Railway Company, has decided to establish a demarcation of the Railway districts. The Railway quarter consists of eleven districts, the area covering 2,702,201 *tsubo* in all, as detailed below:—

Districts.	*Tsubo.*
Antunghsien	1,475,536
Shahochin	49,819
Homotang	22,000
Wulungpei	62,992
Tangshancheng	46,212
Kaulimeng	44,000
Fenghuancheng	162,925
Suhotsz	43,670
Keekuansheng	184,498
Chushuichuang	48,326
Liachaho	44,009

Mr. J. Nakamura, the President of the South Manchurian Railway Company, states that freight traffic is increasing continuously on the line, and constant expansion has to be undertaken to meet requirements. To increase shipping facilities the Company is building an extensive addition to the wharfage accommodation at Dalny, and is also erecting reinforced concrete godowns. Rolling stock is also on the increase, freight cars and second class sleepers being under construction. The Company is building two locomotives at its own workshop at Dalny. The output of the Fusan coal mines is now some 700,000 tons per day, and developments are being carried on to increase that to 900,000 within two years. The Company is at present unable to supply the demand for coal. Arrangements have now been made to enhance travelling facilities for the public through express services having been arranged from Harbin to Tokyo and vice versa. The new second-class sleeping cars will be attached to the express trains between Dalny and Changchun, and also to the Manchuria Korea express trains between Changchun and Fusan. The cars are now in course of construction at the Railway Workshops at Shahokou and were to be completed by the end of October.

Proposed Japanese Lines.—The Japanese have arranged to construct the Shihpingkai-Taonanfu Railway. The contract is not signed, but it is unlikely that any hitch will now occur. This opens up the question of branch railways in Manchuria, which is considered an important matter, though no opposition is expected.

The Chinese and Japanese have agreed that Japan shall provide the money and that China shall build two branches of the South Manchuria Railway; firstly, the Shihpingkai-Taonanfu line which is very important strategically, as it will enable China quickly to check the raids of Mongols, who, in 1912, occupied Taonanfu for a long time and raided Manchuria from it. Taonanfu is considered the most important city in Eastern Mongolia, and it has 100,000 inhabitants. Secondly, a line from Kaiyuan eastwards to Heilungkiang city. Both lines will be valuable feeders of the South Manchuria Railway.

Alleged Russian Demands.—It is reported says the *Peking Daily News*, that the Russian Government has demanded of China certain railway concessions in Manchuria. One of these is a line extending from Tunchisan, 29 versts west of Harbin, to Blagoveshchensk, passing through Hulan, Suihua, Hailun, Mergen and Aigun, covering a distance of about 350 miles.

GENERAL

Duplication of the Trans-Siberian Railway.—The doubling of the rails on the Trans-Siberian Railway between Manchouli (Siberian frontier) and Cheliabinsk (Siberia) will be completed in 1914 and the service will be inaugurated next autumn. Herewith the progress of the works:

(1) The Manchouli-Tanhoi section (1,173 miles) will be completed undoubtedly before winter.

(2) In the Lake Baikal section there are many tunnels to be completed, and great difficulties to overcome that will call for all the knowledge of the engineers,

(3) The Irkutsk-Achinsk section (792 miles) is already completed and ready to be opened to traffic.

(4) On the Achinsk-Channi section there are many rails already laid, but there is still more ballasting work required to finish it. It is possible that this section will be ready for inauguration next winter.

(5) The Channi-Omsk section (183 miles) is opened to traffic.

(6) The Omsk-Cheliabinsk section (746 miles) is almost completed, but some bridges are not yet finished. This section will be ready next spring.

Cheliabinsk is an important station, where the travellers coming from or going to St. Petersburg must change vehicles. When the

double line service is in operation, the voyage from Moscow or St. Petersburg to Harbin will be made in seven days, which will be two days less than at present.

Tokyo-Peking Service.—By an arrangement between the Chinese and Japanese railway authorities, the journey between Tokyo and Peking is shortened to 3 days and 23 hours. Through trains with ferry between Shimonoseki and Fusan, are now running from Shimbashi to Peking via Shimonoseki, Fusan, Antung, and Mukden. Formerly those who went to Peking, took steamer from Kobe to Taku, spending six days on the trip. By rail a trip between Tokyo and Peking took about five days, as the travellers had to stop for a night at Antung and Mukden. The express that goes to Peking in 3 days and 23 hours leaves Shimbashi on Mondays at 8.30 p.m. The through trains from Fusan to Peking leave Fusan on Sundays and Fridays at 9.15 p.m.

Penang Hill Railway.—Construction work on the Penang Hill Railway was to be started on November. 1. Mr. A. R. Johnson is the engineer-in-charge.

LIGHT AND POWER

Kinugawa (Japan) Water Power Co.—A Tokyo paper of September 27 reports that finding its present output of 20,000 h. p. insufficient to meet the demand for power owing to the extension of the tramways in and around Tokyo, the Kinugawa Water Power Company has installed two new generators at its power station at Imaichi. The new plant has satisfactorily passed the official examination and will be put into operation in a few days, when the company's supply of power to the city will be about doubled.

Lake Biwa (Japan) Water Power Co.—The Lake Biwa Water Power Company, in which Messrs. Maekawa, Yoshimura and other prominent business men of Osaka are interested, has applied to the Government for permission for promotion. The proposed capital of the company is 7,000,000 *yen*. It is proposed that a power station be erected on the upper reaches of the Ujigawa to supply some 20,000 h p. to the city of Osaka at rates lower than those at present being charged by the Uji Water Power Company. It is expected in Kwansai business circles that there will be severe competition between the two companies.

Liaoyang Electric Light Co.—The Liaoyang Electric Light Co. has declared a dividend of 7 % per annum.

Electric Trust in Kyushu (Japan).—An extraordinary general meeting of the Kyushu Electric Light Railway Company was held recently to consider a proposal for the organization of a trust to dominate the whole of the electric tramway and lighting trust in Kyushu. Five other companies are concerned in the combine, viz., the Karatsu Electric Tramway Company, the Saseho Electric Light Company, the Nanagawa Water Power Company, the Daikan Electric Light Company and the Itojima Electric Light Company.

Wuchang Electrical Works.—Work has begun on the Wuchang electrical works. The electrical plant is being erected by Messrs. Siemens Schuckwerk, the buildings being given in contract to Messrs. Lothar Marks and Busch.

MINING

Kailan Mining Administration.—The total output of the Administration's mines for the week ended September 13 amounted to 30,356.91 tons and the sales during the same period, to 30,637.89 tons.

Week ended September 20, 36,823.58 tons and sales during the same period, 28,752.22 tons.

Week ended September 27, 39,698.66 tons, and sales during the same period 41,346.24 tons.

Week ended October 4, 40,661.72 tons and sales during the same period, 33,388.28 tons.

Seoul Mining Company.—Telegraphic advice has been received from the headquarters of the above company in America, notifying that the books of the company would be closed from October 11 until the date of the general meeting, to be held at Deep River, Conn., on October 20. It has been decided that an interim dividend of twenty-five per cent (25 per cent.) for the first half of 1913 will be declared at the general meeting.

Coal in Saghalien.—A Tokyo telegram dated October 21 states that an extensive coal field, larger than the Yubari field, has been discovered on the northwestern coast of Karafuto (Saghalien). The coal is of excellent quality.

SHANGHAI TRAMWAYS

The returns of the Shanghai Tramways (Foreign Settlement) for the week ended September 24, 1913, are as under:—

	1913. $	1912. $
Effective receipts (after deducting loss by depreciation of subsidiary coinage)	19,468.10	17,112.64
Passengers carried . . .	1,051,249	902,184
Car miles run.	57,337	53,993

The loss by depreciation of subsidiary coinage for the week was $5,645.10 equal to 23.66 per cent. of the gross cash collected on the cars as compared with $5,059.20 equal to 24.10 per cent. for the corresponding week last year.

Week ended October 1, 1913:—

	1913. $	1912. $
Effective receipts (after deducting loss by depreciation of subsidiary coinage)	19,540.51	17,165.36
Passengers carried. . . .	1,046,758	901,349
Car miles run	58,050	53,730

The loss by depreciation of subsidiary coinage for the week was $5,585.24, equal to 23.37 per cent. of the gross cash collected on the cars as compared with $5,073.68, equal to 24.10 per cent. for the corresponding week last year.

The following is the return for September, 1913, and for nine months ended September 30, 1913, with figures for corresponding periods last year.

	1913. $	1912 $
Effective receipts . . .	82,528.03	71,114.61
Passengers carried . .	4,442,628	3,734,092
Car miles run	245,332	229,032
Loss by depreciation of subsidiary coinage . . .	24,058.29	20,999.82
Percentage of loss by depreciation of subsidiary coinage	23.73	24.10

	9 months ended Sept. 30, 1913 $	9 months ended Sept. 30, 1912. $
Effective receipts . . .	675,842.89	588,875.06
Passengers carried . .	34,743,921	30,068,800
Car miles run	2,126,964	2,058,356
Loss by depreciation of subsidiary coinage . .	189,793.26	180,772.41
Percentage of loss by depreciation of subsidiary coinage	23.16	24.99

Week ended October 8, 1913:—

	1913. $	1912. $
Effective receipts (after deducting loss by depreciation of subsidiary coinage)	20,118.22	16,797.92
Passengers carried. . .	1,083,399	880,530
Car miles run	58,409	54,231

The loss by depreciation of subsidiary coinage for the week was $5,859.48, equal to 23.65 per cent. of the gross cash collected on the cars as compared with $4,927, equal to 23.99 per cent. for the corresponding week last year.

Week ended October 15, 1913:—

	1913. $	1912. $
Effective receipts (after deducting loss by depreciation of subsidiary coinage)	20,461.15	17,192.41
Passengers carried. . .	1,096,008	899,716
Car miles run	59,637	54,426

The loss by depreciation of subsidiary coinage for the week was $5,869.08, equal to 23.34 per cent. of the gross cash collected on the cars as compared with $5,006.26, equal to 23.81 per cent. for the corresponding week last year.

COMPANIES

North China Insurance Co., Ltd.—The report of the directors for the year ended June 30, 1913, states that the balance at credit of the 1912 account is Tls. 212,530.40 and, after deducting an interim dividend of 10 per cent. aggregating Tls. 36,711.30 paid on May 1 last, there remains a sum of Tls. 175,819.10, which the directors recommended should be appropriated in the following manner:—A final dividend of 10 per cent. on the paid-up capital, making 20 per cent. for the year; a bonus of 15 per cent. upon contributory premium; £10,000 transferred to sterling reserve, bringing that fund up to £150,000; and the balance to be transferred to underwriting reserve account, closing the account for 1912. The balance at credit of working account of 1913 to June 30 amounted to Tls. 256,087.77. The company's investments had been written down to the market values as at June 30 last.

San Miguel Brewery Co. (Manila).—The San Miguel brewery company has increased its capital stock to P6,000,000 according to papers filed in the executive bureau at Manila. This is the largest amount of capital ever specified in a set of application papers with the government. The fee of P325 collected is also the largest on record in the archives division. Some years ago the Mindoro Sugar Estates Company incorporated for about P3,000,000 and a fee of P300 was collected. The initial fee for the San Miguel company was P25, and the fee upon the increase of the capital stock P300, making the record figure of P325 in all. Of the P6,000,000 worth of the capital stock of the company P4,841,500 worth has been subscribed to and paid up.

The company has no debts.

Toyo Kisen Kaisha.—The semi-annual meeting of the Toyo Kisen Kaisha was held recently. Mr. Asano, the President, taking the chair. He made a report on the company's business for the half year ended June 30th. He afterwards presented the statement of accounts for the term together with the following proposal for the distribution of profits:—

	Yen.
Net profit	442,530.527
Brought over from last account	4,487.174
Total..	447,017.701
Reserve	23,000.000
Dividend	416,000.000
Carried forward to next account	8,010.701

The accounts having been passed, the proposal to float a loan to the amount of 2,000,000 *yen* was placed before the meeting, and after a brief discussion was carried in its original form.

Nikkan Gas and Electric Light Co.—The distribution of profits of this company was as follows:—

	Yen.
Net profit for the term	218,323.52
Brought over from last acount.	8,259.53
Total	226,583.06

Legal reserve.	10,920.00
Secondary reserve	10,920.00
Bonuses for directors and auditors	7,600.00
Dividend at 9 per cent	184,662.00
Carried forward to next account.	13,081.06

Japanese Companies' Capitalization.—According to the Hypothec Bank the capital called into use for the establishment or enlargement of companies during September last amounted to 37,418,000 *yen*, of which 29,183,000 *yen* was for the establishment of new companies, while 8,235,000 *yen* was for the extension of old concerns.

As compared with the preceding month there was an increase of 10,517,000 *yen* in the capital called into use for the establishment of new companies, and a decrease of 1,975,000 *yen* in the capital for the extension of old concerns. The details are as follows:—

	New. *Yen.*	Old *Yen.*
Spinning (cotton)	250,000	2,500,000
Chemical industries	1,150,000	—
Comestibles	1,100,000	—
Sundry industries	1,365,000	—
Electricity	6,600,000	225,000
Gas	150,000	—
Banking and semi-banking	1,620,000	1,430,000
Trust	100,000	—
Warehousing	1,000,000	—
Insurance	2,000,000	—
Real Estate and Building	2,540,000	—
Public Amusements	1,258,000	—
Sundry Commercial	5,090,000	900,000
Railway and tramway ...	4,450,000	1,180,000
Shipping	50,000	2,000,000
Fisheries	460,000	—
Total	29,193,000	8,235,000

Allgemeine Elektrizitats-Gesellschaft.—The A. E. G. (Allgemeine Elektrizitats-Gesellschaft) at Berlin will pay a dividend of 14 per cent. for last year. The amount of orders is steadily increasing.

China Light & Power Co., Ltd.—The statement of accounts for the year ending 31st July, 1913, shows that the net profit for the year, including the sum of $15,962.55 brought forward and less depreciation on machinery as authorised at last meeting $10,000 was $18,429.10. This was an improvement on the net profit of the previous year of $2,232.87, but not sufficient yet to warrant a dividend. It was recommended that $10,000 be written off the value of machinery, and $5,000 off the value of lines, and that the balance $3,429.10 be carried forward to next year's account.

William Powell, Ltd. (Hongkong).—At the twelfth ordinary general meeting of shareholders of Messrs. William Powell, Limited, the annual report was read as follows:—

The profit for the year is $13,249.39, to which has to be added $2,156.18 brought forward from last year, making a total of $15,405.57, which the Directors proposed to appropriate as follows:—

To pay a dividend of 50 cents per share, 15,000 shares	$ 7,500.00
To write off fixtures and fittings ...	3,000.00
To write off stock	3,000.00
To carry forward to new account ...	1,905.57
	$15,405.57

Dairy Farm Co., Ltd. (Hongkong).—The statement of the Company's accounts for the year ended 31st July, 1913, showed that the profit for the year, after writing off $15,963.10 for depreciation and bad and doubtful debts, and providing for directors' and auditor's fees, amounted to $80,110.27, from which it was proposed to pay a dividend of one dollar and thirty cents per share, absorbing $52,000; to transfer to fire and typhoon insurance fund $8,000; to equalization of dividend fund $20,000; and to carry forward $110.27.

Douglas Steamship Co., Ltd.—The report for presentation to the shareholders of the Douglas Steamship Co., Ltd., on the thirtieth year's working of the company, ending June 30th, 1913, showed that after paying all running expenses, docking charges, premia of insurance, remuneration to the consulting committee and auditors' fees, there remained a balance at credit of profit and loss account of $70,949.02 which, with the approval of shareholders, it was proposed to appropriate as follows:—To pay a dividend of 5 per cent. on the capital of the company, absorbing $50,000 and to write off the balance of $20,949.02 from the value of the company's properties.

Steam Laundry Co., Ltd. (Hongkong).—The Statement of Accounts for the year ended 31st May, 1913, showed that the profit on Working Account was $8,917.11 against $16,506.99 last year and the balance at credit of Profit and Loss $9,404.96, which the Directors recommended should be apportioned as follows:—

Write off Machinery	$ 2,000.00
Write off Buildings	3,000.00
Carry forward to new account	4,404.96
	$9,404.96

Hongkong Cotton Spinning, Weaving & Dyeing Co.—The report for presentation to shareholders at the sixteenth ordinary meeting covering the period from 1st August, 1912, to 31st July, 1913, stated that the net profit for the year amounted to $105,765.73, leaving a balance of $117,779.98 at debit of profit and loss account, and it was proposed that this amount should be carried forward to next year's account.

Philippine Incorporations.—The Zamboanga Lumber Company has been incorporated with a capital of P.200,000. The company proposes to conduct a general business, to own, operate and manage sawmills and lumber yards within and outside of the Philippine Islands, and to engage in a general transportation business in as far as that will aid in the lumbering business. Of the P.200,000 of capital stock P.124,500 has been actually subscribed and paid in. The stock is issued in 2,000 shares of a par value of P.100. The incorporation is for a period of fifty years. All the incorporators are residents of Zamboanga.

WATERWORKS, IRRIGATION, ETC.

Wuchang Waterworks.—It is reported that a contract was signed on October 10th between the Wuchang Waterworks Company and the Syndicate Sino-Européen of Shanghai and Hamburg for the construction of Waterworks at Wuchang. The Works will be situated on the Yangtze River about two miles north of the Wu Shun Men and the water will be taken from the Yangtze River and subjected to a double process of filtration according to the latest methods. The Water Tower will be executed in reinforced concrete on top of Serpent Hill and the water will be distributed from there by a system of pipes extending throughout the whole city. The work of construction will, according to the *Hankow Daily News*, start immediately after the final plans have been drawn up and will be in charge of Mr. Max M. Engel, the Engineer-in-Chief of the Shanghai Chinese Waterworks Systems in Nantao and Chapei.

OIL

Petroleum Yield in Japan.—In 1908 the yield of petroleum oil in Niigata Prefecture reached 1,800,000 *koku*. Since then it has been on the decrease, but in consequence of the rotary borers brought into use the yield is again improving. According to the latest reports to hand, during the eight months ended August 30th last a total value of 1,090,000 *koku* was obtained. In view of the wells at Kaguchi and Takiya showing symptoms of an increasing yield, it is expected the figures will leap up to upwards of 1,900,000 *koku* by the end of the year, which, as compared with last year, is an increase by 500,000 *koku*. This will beat the record by 100,000 *koku*. This is estimated to be an increase in value by 50 per cent., prices having gone up as compared with last year.

Although the oil market at present is dull, the underlying tone is quite firm, the season of the greatest demand having already set in. Moreover the oil companies are doing their utmost to keep prices up by means of a special arrangement among themselves. Unreasonably high prices are now ruling, therefore, despite the flagging demand.

HARBOURS, DOCKYARDS, ETC.

Taikoo Dockyard.—The finely modelled steel motor vessel, *Tung Kwong*, built to the order of the Asiatic Petroleum Co., Ltd., was launched recently at Taikoo Dockyard. The vessel is 116 feet long over all, 19 feet 6 inches beam, and 9 feet 6 inches moulded depth and has a straight stem and elliptical stern, one pole mast with derrick, also one derrick post with double derricks. Compartments under deck are arranged for carrying benzine in drums, oil in bulk and in tins. Officers and crew are accommodated in rooms aft around the casing. The machinery for driving the vessel consists of one set of Bolinder's direct reversible crude oil motors capable of developing 230 B. H. P. Hand windlass, steering gear and winches are installed, and all the latest appliances for the economical working of this type of vessel.

Steam Ferry for Pukow.—On October 18th the steam ferry *Feihung*, constructed at the Nicholas Tsu shipbuilding yard for the Tientsin-Pukow Railway (Southern Section) was launched in the presence of Mr. Chao Ching-hua, associate managing director of the railway and a number of guests. The following are the particulars of the vessel, which is of 542 tons' displacement. Length over all, 151 ft. 6 in.; length between perpendiculars, 143 ft.; breadth, 25ft.; depth, 14ft.; and load draught, 10ft. She is a twinscrew steamer, capable of steaming thirteen knots, and is fitted with compound engines, with cylinders 13 in. and 28 in. in diameter, with an 18 in. stroke. On the upper deck are two large saloons for the use of first-class passengers, and the main deck is reserved for Chinese passengers and baggage.

Kawasaki Dock, Dairen.—The widening and extension of the entrance to the Kawasaki Dock, Hamacho, Dairen, is making steady progress, and is very likely to be completed during November. The management is hastening its completion, and recently started night work for the purpose of building the box-caisson as early as possible. The Dock management and shipowners are feeling it a matter of necessity to instal a slip-dock for smaller vessels of 300-500 tons class to facilitate their inspection, repair work, etc. The Dock authorities are in communication with the Head Office, Kobe, concerning the matter, but particulars about the site, size, etc., are not yet available.

Harbour Works at Dairen.—The *Manchuria Dairy News* learns that the appropriation for the S. M. R. Co. Harbour Works Office for the next fiscal year will be about the same as that for the present fiscal year, and be about Y3,000,000. The principal items of work will be the reclamation of the shore front at the east of East Quay, the construction of the North-west Breakwater, the reconstruction of the quay wall on the west side of Main (West) Quay, and the construction of the new third quay to the west of Main Quay. These are all continuations of work now in progress. It is unlikely that new undertakings requiring a heavy outlay will be started.

FINANCIAL

The China Industrial Co.—A Tokyo paper reports that preparations for the commencement of business of the China Industrial Company (also known as the Sino-Japanese Corporation) have been making steady progress. The company is now negotiating with British and French capitalists as to the ways and means of joint investment.

Up to the present the company has received more than ten applications from different parts of China for loans. Among these are applications from railway, telephone, gas, tramway and electric light undertakings. The company, however, being still in the first stage of its organisation, cannot accept all these applications, though it hopes to supply as many undertakings as possible with capital. The company is now engaged in investigation with a view to selecting the most suitable and will then invest in a few of these as a first step. It is not expected that the company will actually start operations before the end of the year.

Japanese Government Bonds.—It is announced by the Japanese Finance Department that the special 5 per cent. bonds will be redeemed to the amount of Y20,000,000 at the end of November. The Japanese journals, in commenting upon this, note that in the past the Government has desired to redeem a portion of the annual amount (Y.50,000,000) to be redeemed during the season when money is badly wanted by the public, but it has been absolutely impossible for the Government to carry out its intention without issuing Exchequer bills, and so the redemption has not been effected. A large surplus has been carried over from the national accounts for last year, which has enabled the Government to redeem the bonds this year. It may be thought by some more advisable to redeem the bonds in December, but interest on national bonds is paid by the month, and if the bonds are redeemed even early in December, interest must be paid for a whole month, whereas if redeemed at the end of November interest for one month—amounting to about Y.300,000—will be saved. The special 5 per cent. which now outstand at Y.239,323,950, will be redeemed to the amount of Y20,000,000. The annual amount (Y219,000) of the "old bonds," which are outstanding at Y1,975,500, will be redeemed at an opportune time.

Banking Business in Chosen.—According to the *Yomiuri*, it appears the banking business in Chosen is still in its primitive stages. The following schedule gives the names of the banks operating in the peninsula, their paid up capital and the rate poid in dividends:—

Name	Paid up Capital	Rate of Dividends
Chosen Ginko	Y 7,500,000	6%
Kanko Noko Ginko ...	321,000	12%
Heian Ginko	137,000	12%
Keisho Ginko	110,000	12%
Zenshu Ginko	100,000	10%
Koshu Ginko	100,000	10%
Seikyo Ginko	79,835	10%
Branch of Dai Ichi ...	1,800,000	10%
„ 18th Bank ...	1,150,000	8%
„ 130th Bank ...	700,000	8%
Suwo Ginko...	312,500	8%
Kanjo Ginko	750,000	7%
Kanichi Ginko	125,000	10%
Chosen Shogyo Ginko.	247,813	10%
Mitsuyo Ginko	50,000	15%
Total	Y13,483,148	

The above mentioned banks have been doing a fair business in comparison to their respective spheres.

The amount of deposits and loans passing through these banks for the past three years were as follows:—

Year	Deposits	Loans
1909...	18,397,631 *yen*	17,699,587 *yen*
1910...	16,889,109	22,990,600
1011...	18,704,267	25,156,068

The deposits showed a decrease in 1910 owing no doubt to popular sentiment being disturbed on the occasion of the annexation.

The business position of these banks may be further shown by the following figures:

Year	Loans	Overdrafts	Bills Discounted	Bills of Exchange
	yen	*yen*	*yen*	*yen*
1910	8,688,464	1,577,503	11,071,525	1,658,108
1911	9,898,244	1,952,176	12,912,175	393,503

Trade of the Philippines.—The total trade of the Philippines with the United States for the fiscal year 1913 amounted to P91,235,034 compared with P84,822,238 for fiscal year 1912, a gain of P6,412,796. Of the total of trade the importations from the United States for 1913 was P51,293,750, compared with P41,582,866, a gain of P9,710,884 or 45 per cent. of the total importation to the islands. The export to the United States fell off from P43,239,372 in 1912 to P39,941,284 in 1913 or P3,298,388, so that the United States enjoys a trade balance against the islands of P11,352,-466 for the fiscal year just ended.

The total trade of the islands for the fiscal year 1913 amounted to P220,021,700 as against P209,738,632 for 1912 or a gain of P10,282,-086. The exports amounted to P107,366,652 for 1913 as against P100.639,672 for 1912, an increase of P6,726,980, while the imports for 1913 amounted to P112,655,066 against P109,099,060 for the previous year, an increase of P3,555,106.

Yokohama Specie Bank—The Yokohama Specie Bank has decided to establish a branch at Tsingtao, where the number of Japanese residents is steadily increasing. The branch office was opened on Nov. 1st, with Mr. Ota as Manager.

Austrian Loan to China.—The Vienna Discount Bank and the Land Credit Institute have concluded a China loan of £2,000,000 in six per cent. treasury bonds.

The Boxer Indemnity—The Financial Department, according to the *China Tribune*, has sent a circular note to the various provinces urgently requesting them to remit to the Central Government the amount of the Boxer Indemnity allotted to them. The sums in arrears are as follows:—

	Tls.
Chihli	1,841,000
Eastern Provinces..............	3,474,250
Kiangsu	7,931,350
Anhui	2,531,500
Shantung	1,505,000
Shansi	1,618,500
Honan	1,909,600
Shensi	999,000
Kansu	350,000
Hsinchiang	460,000
Fukien	2,250,000
Chekiang	4,047,000
Hupeh	4,059,000
Kiangsi...........................	3,443,000
Hunan	1,407,400
Szechuan	3,928,000
Canton	7,310,000
Kwangsi	647,500
Yunnan	417,000
Kueichow.........................	206,000
Total...............	46,991,500

Another Quintuple Loan.—Telegrams from Peking state that President Yuan Shih-kai having agreed to the proposals of Hsiung Hsi-ling with regard to a second large loan from the Quintuple Syndicate, the Premier will open negotiations with the Syndicate after having submitted the policy to Parliament.

The amount of the new loan will be £25,000,-000. The Salt gabelle will be pledged as security and the terms will be the same as those of the first large loan.

PERSONAL

Mr. A. A. Williamson (American Consul at Antung) has been transferred to Taihoku (Formosa).

Mr. J. P. Donovan, the Shanghai District Postmaster, Chinese Postal Service, has received the 5th class of the order of the Excellent Crop.

Mr. Clifford H. French has been appointed auditor of the Philippines in succession to Mr. William H. Phipps.

It is stated that Mr. Kenrick, the chief engineer of the Peking Syndicate, is to succeed Mr. J. R. Brazier as agent-general when the latter goes home, his resignation having been accepted.

Mr. C. D. Meinhardt has been appointed Deputy Consul-General for the Unites States at Hankow. He has been a student interpreter at the American Legation at Peking.

Dr. Y. C. Chang, Commissioner for Trade and Foreign Affairs at Shanghai, has been transferred to Wuhu, where he will combine the post of Commissioner of Foreign Affairs with that of Superintendent of Customs. Mr. Yang Cheng, formerly Minister to Austria-Hungary, will succeed Dr. Chang at Shanghai.

Herr von Haxthausen, German Minister, returned on the 15th instant to China.

Mr. Dorpmuller, the engineer-in-chief of the northern section of the Tientsin-Pukow Railway, has received the 4th class of the Red Eagle decoration from His Imperial Majesty Kaiser Wilhelm.

Mr. F. J. Mayers, Commissioner of Customs, returned to Chefoo on October 4th.

Count L. Jezierski, manager of the Russo-Asiatic Bank, has returned from his holiday at Home, and has assumed charge of his duties.

The Rev. Arthur Sowerby has entered on his duties as tutor to the family of President Yuan Shih-kai.

Mr. J. B. Suttor, Commercial Commissioner of New South Wales, visited Shanghai early in October after an extended business trip in the North.

Mr. Ed. Blacher has arrived at Hankow and taken over the management of the Russo-Asiatic Bank; Mr. S. de Jastrzembaki having been appointed co-Manager at Shanghai.

Mr. W. Cameron Forbes, late Governor-General of the Philippines, passed through Singapore on the French mail steamer Australien. He is proceeding to India, which country he will tour for several weeks, and will then go on to America via England.

The Inspector-General of the Chinese Customs, Mr. Aglen, has returned to Peking from his trip home.

At the annual general meeting of the Engineers' Society of Shanghai the following were elected to serve upon the council for Session 1913-14: President, Mr. A. C. Clear; Vice-Presidents, Messrs. D. C. Dick, S. J. Powell, and H. von Heidenstam; Members of Council, Messrs. A. E. Algar, P. H. Cole, J. S. S. Cooper, C. Harpur, F. O. Reynolds, S. S. Sellick, W. F. Tyler, E. H. Underwood, and M. Wantz; Hon. Secretary, Mr. W. J. Williams.

Mr. L. de Hoyer, special representative of the Russo-Asiatic Bank, has returned to Peking from St. Petersburg.

Mr. Krisel has gone to Swatow to take up his post at the American Consulate there as Vice-Consul in charge.

The post of British Consul-General of the Dutch East Indies has been offered to and accepted by Mr. W. R. D. Beckett, C. M. G., at present Consul-General in Bangkok.

Mr. Jonkheer F. Beelaerts von Blokland, Minister of the Legation of the Netherlands will return to Peking in the beginning of December.

Mr. A. W. U. Pope, General Manager of the Shanghai-Nanking Railway, returned to Shanghai on September 29th from England.

It is reported from Peking that Mr. Yoshisue Yoshida, a Japanese government engineer, retired from the department of Forests, has accepted a similar position with the government of China.

Vice-Governor Gilbert, of the Philippines, has resigned.

Mr. MacMurray, the First Secretary of the American Legation, will arrive in Peking by the 24th of November, while Dr. Paul S. Reinsch, the new American Minister, who sailed from San Francisco on October 7th on the *Tenyo Maru*, was expected to arrive at the end of October.

Mr. E. Mortimer Reid, and Mr. C. Percy White, of Shanghai, have been registered as auditors under the Companies Amendment Ordinance, 1913.

The old firm of Messrs. Anz & Co., of Tsingtao, has been taken over by Messrs. C. Benck and E. Kretzschmar, and will in future be known as Benck & Kretzschmar.

Mr. Stephen Bonsal has been appointed assistant executive secretary of the Philippine Islands.

Mr. H. Schmidt, of the Deutsch Asiatische Bank, has been appointed auditor for the German and American sections of the Hankow-Szechuen Railway.

Mr. Percy Julian Sproule (Solicitor-General, Penang) has been appointed Puisne Judge of the Supreme Court of the Straits Settlements.

Mr. J. Nakamura, President of the South Manchurian Railway Company; Mr. K. Kudota, a Director; Mr. K. Uyeda, Secretary, and Dr. Omy, the Company's medical officer, spent a few days in Peking about the middle of the month, and later travelled to Hankow and Shanghai, and then returned to Dalny. The party was merely on a sight-seeing tour. While in Peking they were lavishly entertained by their countrymen and Cninese bodies.

Dr. Chen Chin-tao, who was Minister of Finance in the Provisional Republican Cabinet at Nanking, has been appointed Financial Commissioner for China in Europe.

Major Nathan, General Manager of the Kailan Mining Administration, has returned to Tientsin.

Mr. C. W. Kinder is visiting Peking.

The appointment of Mr. C. Koike to the Directorship of the Bureau for political affairs (Japanese Foreign Office) as successor to the late Mr. Abe has been announced.

M. Kurachi is reported to be leaving for China, with a view to negotiating concessions in north China on behalf of the Sino-Japanese Commercial Trust, of which he is Vice-President.

Mr. Hemeling, who has recently returned from furlough, has been appointed Commissioner in charge of the Wuhu Customs.

M. W. Trautschold (late Russian Consul at Dalny) has taken up his position as Russian Consul-General at Harbin.

Captain Harold Christian has been appointed Director of the new Chinese naval college to be established at Shanghai.

Public Notification

CHINESE GOVERNMENT RAILWAYS

Shanghai-Nanking Railway

1. In the exercise of my authority as Managing Director of the Shanghai-Nanking Railway, I hereby give Notice that the public use of this Railway for the carriage of both Coaching and Goods Traffic is, and will be, till further notice, governed by, and subject to, the Bye-Laws and Regulations issued for the conduct of the same and exposed in the Premises of the Company, extracts thereof being posted in the vehicles in use.
2. Copies of such issues are available to the public on application to the Administration.
3. The substance of paragraph 1 of this notification will be printed on the backs of all Railway tickets, Goods Receipt Notes and similar documents as a condition of their issue to the public.

M. Y. Chung,
Managing Director.

Dated 5th June, 1913.
Managing Director's Office,
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China Mutual Life Insurance Co., Ltd.

Locks
Yale & Towne Mfg. Co.

Lubricants
Albany Lubricating Co.

Lumber Dealers
Robert Dollar Co.
China Import Export
Jardine, Matheson & Co.
Port Banga Lumber Co.

Machinery Merchants
Andersen, Meyer & Co.
Arnhold, Karberg & Co.
Shanghai Machine Co.
Fearon, Daniel & Co.
Frank L. Strong
Schuchardt & Schutte.
Shanghai Dock & Engineering Co., Ltd.
Samuel & Co., Ltd.
Tulloch & Co.

Mill Machinery
Rose Downs & Thompson Ltd.
Shanghai Dock & Engineering Co., Ltd.
A. F. Craig & Co., Ltd.
E. R. & F. Turner

Mining Machinery
American Trading Co.
Melchers & Co.
Shanghai Dock & Engineering Co., Ltd.
Shewan, Tomes & Co.
New York Engineering Co-

Mineral Oil Plants & Machinery
A. F. Craig & Co.

Motors
Shanghai Dock & Engineering Co., Ltd.
Pratt's

Motor Launches
Shanghai Dock & Engineering Co., Ltd.

Paints Oils and Varnish
Standard Oil
Albany Lubricating Co.
F. A. Vander Loo & Co.
J. Dampney & Co.

Packing
Greene Tweed & Co.

Pulleys (Steel)
Schuchardt & Schütte
Shanghai Machine Co.
Shanghai Dock & Engineering Co., Ltd.

Pumps
The Goulds Manufacturing Co.
Shewan, Tomes & Co.
Jardine, Matheson & Co.
Shanghai Machine Co.
Shanghai Dock & Engineering Co., Ltd.
Joseph Evans & Sons

Railroads
Chinese Government Railways
Manila Railroad Co.
South Manchuria
Southern Pacific Co.
Chosen (Korea) Railways.

Railroad Supplies
American Trading Co.
American Locomotive Co.
Andersen, Meyer & Co.
Arnhold, Karberg & Co.
Baldwin Locomotive Work.
Fearon, Daniel & Co.
Hannoversche Maschinenbau A. G. Vormals Georg Egestorff.
Henschel & Sohn.
P. Herbrand & Co.
Jardine, Matheson & Co., Ltd.
Melchers & Co.
Mitsui Bussan Kaisha
Shewan, Tomes & Co.
Shanghai Machine Co.
Shanghai Dock & Engineering Co., Ltd.
Tyer & Co.
U. S. Steel Products Co.
Railway Signal Co., Ltd., The
Robert Dollar Co.
Samuel & Co., Ltd.
Dick, Kerr & Co., Ltd.
Avonside Engine Co., Ltd.
Siemssen & Co.
T. H. Symington Co.

Reinforced Concrete Construction
Shanghai Dock & Engineering Co., Ltd.
Trussed Concrete Steel Co.
U. S. Steel Products Co.

Roofing Paper
California Manila Lumber Commercial Co

Rope Manufacturers
Johnson-Pickett Rope Co.
U. S. Steel Products Co.
Ynchausti & Co.
Shewan Tomes & Co.

Ship-Chandlery
Ynchausti & Co.

Shipping Agents
Cia. General de Tabacos
Shewan, Tomes & Co.
Stevenson & Co., Ltd.

Shipbuilding and Repairs
Fiat-san Giorgio Ltd.
Tsingtauer Werft
Hongkong & Whampoa Dock Co., Ltd.
Kiangnan Dock and Engineering Co., Ltd.
Mitsu Bishi Dock and Engineering Works
Shanghai Dock and Engineering Co., Ltd.
Smith's Dock Co., Ltd.
The Taikoo Dockyard and Engineering Company of Hongkong, Limited
William Cramp & Sons.

Steamship Companies
Cia. General de Tabacos
Pacific Mail S. S. Co.
Ynchausti & Co.
Toyo Kisen Kaisha.

Steel Manufacturers
United States Steel Products Export Co

Steel Works
Bohler Bros. & Co., Ltd.
U. S. Steel Products Co.

Stokers
Babcock & Wilcox Ltd.

Structural Steel
Bohler Bros. & Co.
Shanghai Dock & Engineering Co., Ltd.
U. S. Steel Products Co.

Sugar Machinery
Honolulu Iron Works.
A. F. Craig & Co.

Superheaters
Babcock & Wilcox Ltd.

Tanks
Pacific Tank and Pipe Co.
Shanghai Dock & Engineering Co., Ltd.
U. S. Steel Products Co.
A. F. Craig & Co.

Telephones
The Western Electric Co.

Textile Machinery
A. F. Craig & Co.

Tiles and Bricks
Green Island Cement Co., Ltd.
Chinese Eng. Mining Co.

Tobacco Dealers
British-American Tobacco Co., Ltd.
Cia. General de Tabacos
Olsen & Co., Walter E.

Tools
American Tool Works Co.
Lodge & Shipley Machine Tool Co.
Shanghai Machine Co.
Easterbrook Allcard & Co., Ltd.
The Selson Engineering Co., Ltd.
Shanghai Dock & Engineering Co., Ltd.

Windmills
Defiance Machine Works.

Water Softeners
Babcock & Wilcox Ltd.

Wood Working Machinery
American Tool Works Co.
Defiance Machine Works.
Lodge & Shipley Machine Tool Co.
Shanghai Dock & Engineering Co., Ltd.

THE FAR EASTERN REVIEW

COMMERCE :-: ENGINEERING :-: FINANCE

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AN APPRECIATION OF CHINA'S RAILWAY ENGINEERS

By GEO. BRONSON REA.

When the construction of the Kalgan railway was entrusted to a Chinese engineer, many foreign railway builders shook their heads and prophesied that the line could not be completed without their assistance, otherwise it would be unserviceable and unsafe. They refused to believe that any foreign educated Chinese engineer could successfully push a railway up the Nankau Pass to Kalgan. They had constructed the existing open lines under the terms of loan agreements which gave them full technical control, and they practical finish to his technical education. When the whirligig of Chinese politics under the Manchu *régime* brought his old school friends into high power, and they determined to construct the Kalgan Line with Chinese survey, and with Chinese engineers, without the assistance of any foreigners, they selected Mr. Jeme Tien-yu as the man who would faithfully carry out the work entrusted to him. He took with him a few of his associates on the Peking-Mukden line, and surrounded himself with the best available men on whom he could rely. terpreter, and in fairness this fact should not be forgotten when instituting comparisons. This highly important functionary who received an average salary of $40.00 Mexican per month, was able to take advantage of the unfortunate conditions and, as a rule retired with a fortune after several months' engagement. This system was eliminated under Mr. Jeme's management ; his Chinese assistant engineers settled the prices directly with the Contractor, exacted an adequate security, and then saw that the work was done according to specification. It is said

The Engineers who built the Kalgan Railway. Mr. Jeme Tien-yu is in the centre of the lower row.

established the precedents and created the unit prices for construction work. It is hardly surprising that considerable doubt was felt whether a Chinese engineer would be able to equal the records that had already been established and considerable headshaking accompanied the appointment of Jeme Tien-yu to the position of Engineer-in-Chief to the Kalgan Line. Mr. Jeme had graduated from Yale University as a civil engineer, and passed many years in the service of the Peking-Mukden line under Mr. Kinder, where he acquired the

They were obsessed with one idea ! To show the foreigners that they could build a serviceable line and keep the cost down to the Chinese idea of prices. Honesty was the keynote of Jeme's administration. By the elimination of all squeeze and commissions and dealing direct with the sub-contractors on the line, the unit prices for work were brought down to an unheard of low rate. Through their ignorance of the language, and Chinese costs for similar work, foreign engineers of the loan constructed lines were compelled to do business through an in-

that several of the sub-contractors on the Kalgan Line committed suicide, because of the strict supervision which compelled adherence to the specifications. Such incidents shed a sidelight on the methods employed in enforcing strict compliance with the specifications and emphasizes the honest character of Jeme's management. The incidents have been used to discredit Jeme with his countrymen and prove him to be a hard-hearted and bad man. A little reflection will, however, convince one that his attitude in enforcing specifications on a losing contract was

absolutely essential to establish honest methods, otherwise the Kalgan Line, instead of being a monument to Chinese engineering skill, would have resulted in a costly, unsafe experiment to stand as an everlasting argument against China's ability to build railways and handle construction funds. The cost of foreign built Chinese railways through open country has averaged £10,000 per mile. The Kalgan line, piercing over a mile of tunnels and with heavy rockcuts and costly embankments, was completed at a cost of £8,000 per mile. Jeme's assistants learned the practical side of railway construction in this school, and although some of them have since been employed elsewhere others have remained on the Kalgan line, and have been entrusted with the construction of its extension to Kweihau-Chang. This line is known as the Changshui Extension.

The example set by Jeme in the Kalgan line has been followed in the construction of the extension by his former subordinates, with the result that even Jeme's costs have been lowered, and new records created.

In the August number of THE FAR EASTERN REVIEW appeared a full illustrated description of the work on the Changshui extension. In company with a well known British railway engineer I have since made the trip over the line to Tatungfu and inspected the work. If the Chinese deserved credit for the Kalgan Line, they are entitled to a fuller meed of praise for the manner in which they have

Mr. Chen Shi-lin, Assistant Engineer-in-Chief, Changsui Extension

constructed its extension. The Chinese are entitled to full unqualified credit wherever and whenever they have demonstrated their ability to survey, construct and equip a substantial serviceable railway. I have been over most of the railways in China, and am convinced that the construction work in the Changshui extension is equal to the best built line in China, and its cost is far below any similar line in the world. When the Chinese built the Kiangsu and Chekiang Railways, interested critics compared these lines with the Shanghai-Nanking, overlooking the fact that the cost was only about $30,000 gold per mile against a cost of $55,000 on the foreign built line. And when Jeme successfully

Mr. K. Y. Kwong, Engineer-in-Chief, Peking-Kalgan-Tatungfu Railway

terminated the Kalgan line, the same critics went out of their way to point out defects in grade and construction to justify their one-sided viewpoint. These criticisms have placed the Chinese engineers on their mettle, and to avoid the possibility of further reflections on their capacity, they have constructed the Changshui line with extreme care and solidity, and impartial critics will now admit that they have swung around to the other extreme and have constructed a line far too good for the traffic requirements of that country.

The mantle of Jeme Tien yu has fallen on Mr. K. Y. Kwong, who has directed the Changshui construction. Mr. Kwong is also a foreign educated engineer, with considerable experience in construction work. His assistant engineers, however, upon whose shoulders has devolved the supervision of the actual work, have never been out of China, and their entire experience has been gained either under Mr. Kinder or Mr. Jeme, and only under the latter were they allowed to assume any responsibility in serious construction work. With Mr. Kwong has been associated Mr. Chen Shih-liu as Assistant Chief and Mr. Chai Chao-tin in charge of construction. The line was surveyed and located by Mr. Chen, and Mr. Chai assumed actual charge of construction. The trio of engineers with their loyal assistants have bent every energy to avoid unfriendly criticism and establish a new record. They have done it.

The average cost of earthwork on the Shanghai-Nanking Railway was 15 cents silver per cubic yard, on the Canton-Kowloon line, 33 cents per yard, whereas the average cost per cubic yard on the Changshui extension has been about 6 cents per cubic yard. The cost of rock cuttings on the Canton-Kowloon line averaged $2.00 per fong or 50 cents per cubic yard, on the Changshui extension the highest price was 25 cents per yard. The average cost of concrete work was $6.25 silver per cubic yard, against a cost nearly twice as high in other parts of China. And so with nearly all other unit prices.

Labor costs are generally about 25 per cent. higher in the South than in the North, and this has to be taken into consideration, but allowing for all possible variations, it is a fact that the unit prices paid for construction on the Changshui extension are far below those possible to obtain in other parts of China, and as a consequence the line cost less, and the engineers have been enabled to construct a line beyond criticism. These men are worthy of all praise and commendation, and justly merit some recognition on the part of the higher authorities in Peking. The order of the Chia-ho has been generously conferred for political and other reasons on officials who have contributed far less towards the advancement of the Republic, and who are less worthy to receive it than these conscientious engineers, who have laboured to establish their country's right to recognition as railway constructors. If in the next distribution of honors from the Presidential Palace, the names of K. Y. Kwong, Chen Shih-liu and Chai Chao-tin should be amongst those entitled to wear the highest order of the Chia-ho, in their cases it would be only a just recognition of their services to the Republic, and serve as a stimulus for other young railway engineers to do their best for the good of their country.

Mr. Chai Chao-tin, District Engineer, Changsui Extension

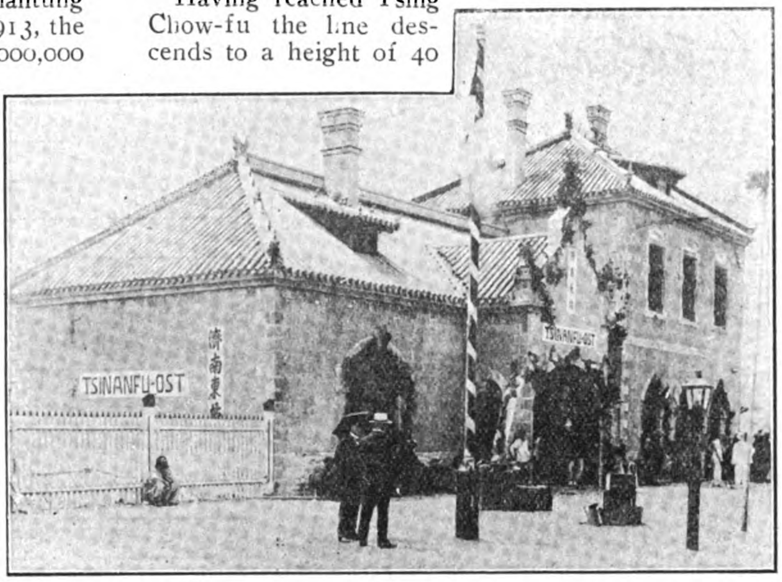
THE TSINGTAO-TSINANFU RAILWAY

Under the title of "Germany's Rights in Shantung," in the last issue of the FAR EASTERN REVIEW, we described in general terms the route of the Tsingtao-Tsinanfu railway, and published the 1912 report of the working of the line. We now propose to give further details as to the character of the railway, which is, as previously explained, the property of the Shantung Railway Company. The original capital of the Company was 54,000,000 Marks, but when the Company took over the rights and property of the Shantung Mining Company on January 1, 1913, the capital was increased to 60,000,000 Marks, divided into 60,000 shares of 100 Marks each.

The grading for the road-bed began on September 23, 1899, at Tsingtao and Kiaochow, when His Royal Highness Prince Henry of Prussia turned the first sod. The engineers planned a single track, standard gauge line, and work was carried on in both directions, east and west, some 25,000 laborers being employed. Progress was fairly rapid, the grading of the road-bed presenting few engineering difficulties. For the greater part of its length the line runs through flat country, skirting the foot of the mountains in middle Shantung, and dynamite was only employed in a few places in the German leased territory and in a few cuttings on the western section.

Starting from Tsingtao station, which is eight metres above the sea, the railway crosses several low chains of hills between the larger rivers, and on reaching the water-shed of the Yun-ho, attains a height of eighty-eight metres, gradually ascending as far as the city of Tsing Chow-fu. Wide streams such as the Pai Cha-ho, Schyk a-ho, and Taku-ho, are crossed before Kiaochow, at the head of the bay, 74 kilometres from Tsingtao, is reached, and thence to Changling, 128 kilometres from Tsingtao, the line passes through a fertile plain crossing the two rivers, Mischui-ho and Kiau-ho. West of Changling the line reaches the hilly country and passes the ranges in long winding curves to Wei-hsien, 183 kilometres from Tsingtao. Many rivers rise in this part of the country, two of them being spanned by bridges of nearly 300 metres in length each.

Having reached Tsing Chow-fu the line descends to a height of 40 metres near Chow-tsun, and about 20 kilometres west of that city a chain of mountains running from south to north is crossed, the height reached at Wang-tsun being 158.73 metres above sea level. From this point the line gradually descends to Tsinanfu, where the altitude is but 34.80 metres above sea level.



THE TSINGTAO-TSINANFU RAILWAY.—Second class station at Tsinanfu East

Branch lines.—A branch line, 40 kilometres in length, beginning at Changtien, which is 47.17 metres above sea level, runs in a southerly direction up the Poshan valley, following the course of the Hsiau-fu-ho. The town of Tzechwan, the centre of the coal mines of the Company, is passed en route, and the terminal station is at Poshan, 179.40 metres above the sea.

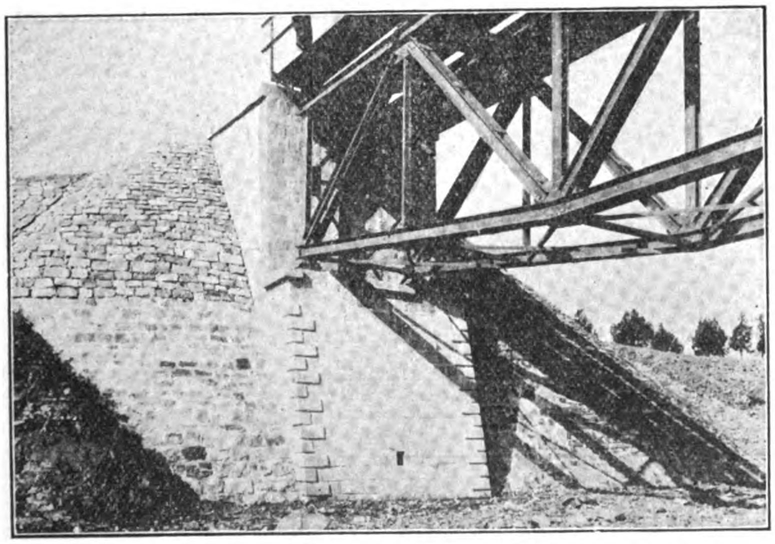
A branch line seven kilometres in length from Setchwan also connects with the Hungchan coal mines; another branch four kilometres in length joins the main line at Fangtze with the coal mines, while another branch at Tsinan-fu, eight kilometres in length, gives connection with the Yellow River. In a short time a new branch seven kilometres long will be open to the iron mines at Chinlin chen, where work has just been begun.

Length of Line and Gradients.—The total length of the main line is 400 kilometres, or 395,373.75 metres, of which there is a level grade of 41.62% for 164,452.68 metres. The ascending grade from east to west is 29.01%, the descending grade being 29.37%. The straight track totals 299,323.42 metres, or 75.71%, the curves absorbing 24.29%.

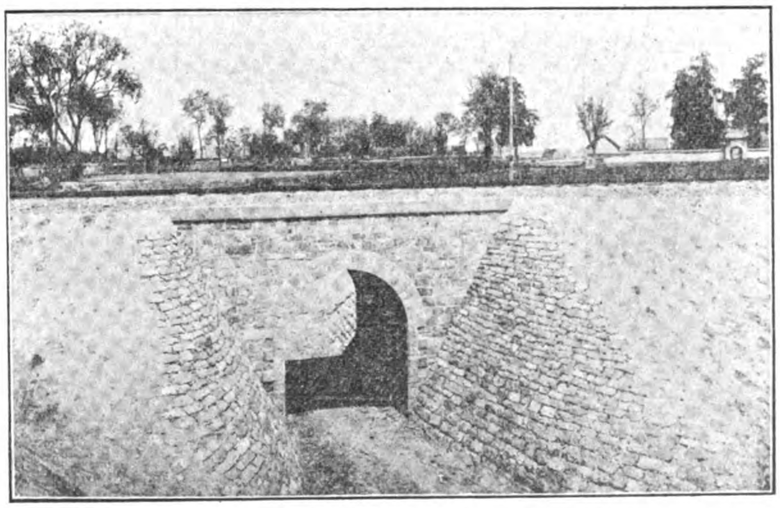
The Poshan branch line has a length of 39,200 metres, the level grade being 30.42%, and the ascending grade 69.58%. The straight track totals 27,410.04 metres, or 69.94%, the curves totaling 30.06%.

The steepest grade on the main line is one in 150, and on the Poshan line one in 100. The sharpest curve has a radius of 300 metres.

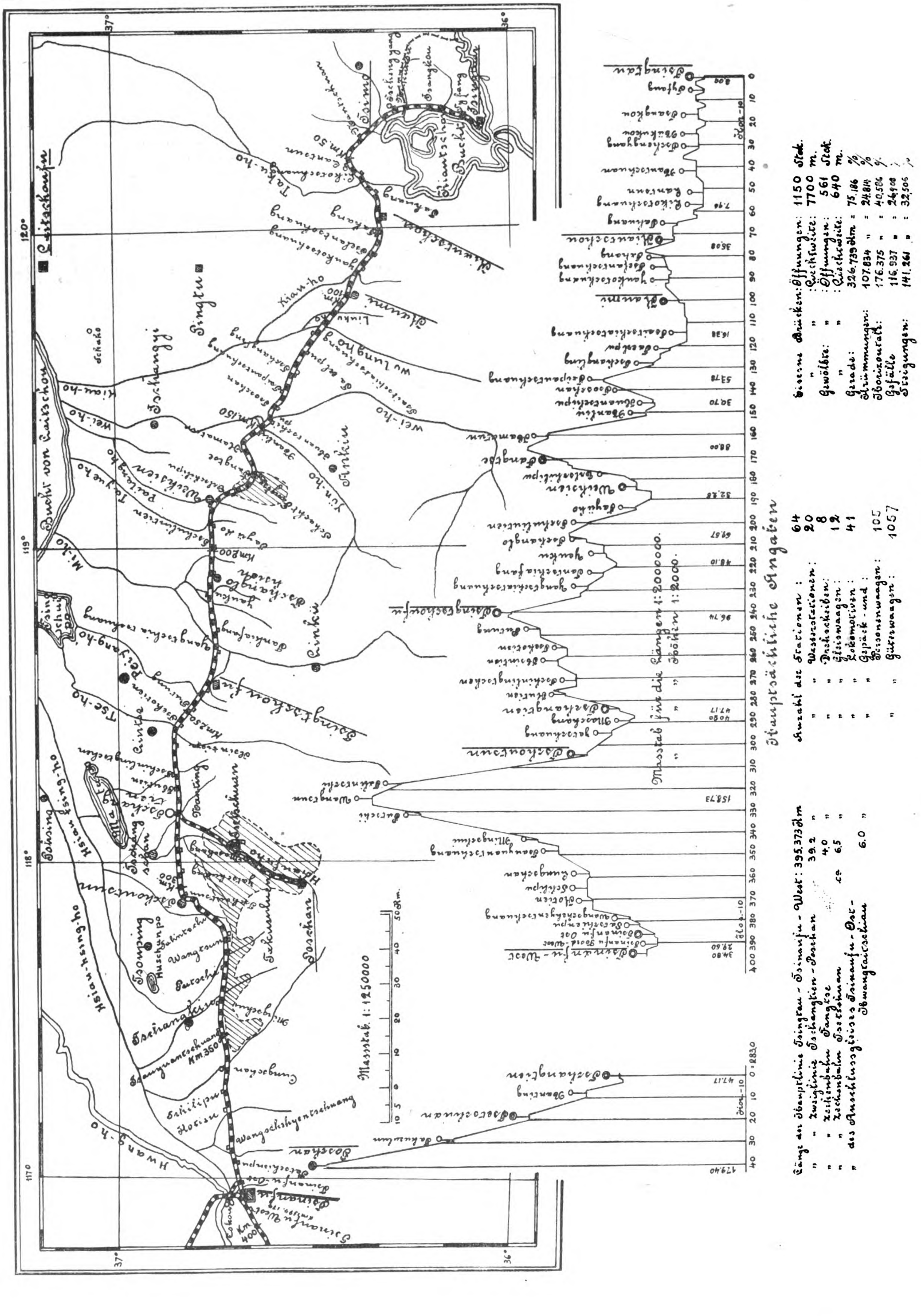
Road-bed.—The road bed is five metres wide, the slope being one in 1.5. In flat country, where floods occur, the slope is one in 2. Excavations are likewise five metres at the bottom. Ditches wide enough to carry the water which runs from the sides of the excavations have been made and lined with cement plaster.



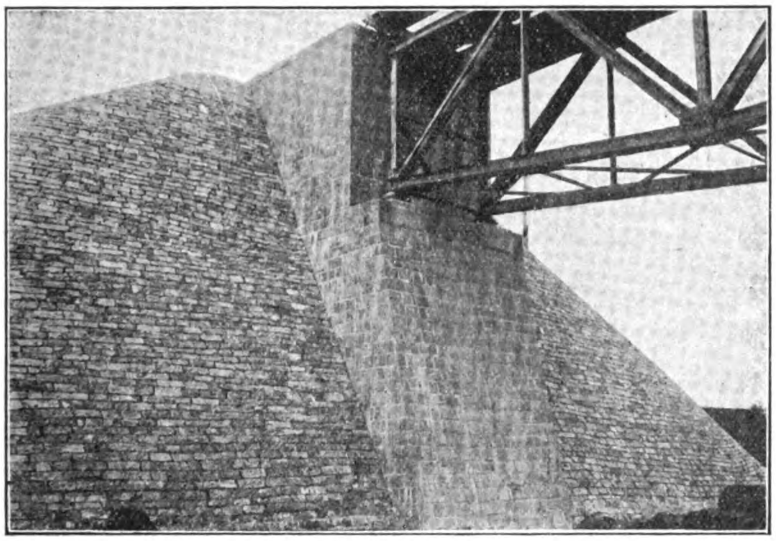
THE TSINGTAO-TSINANFU RAILWAY.—Abutment of bridge at kilometre 326



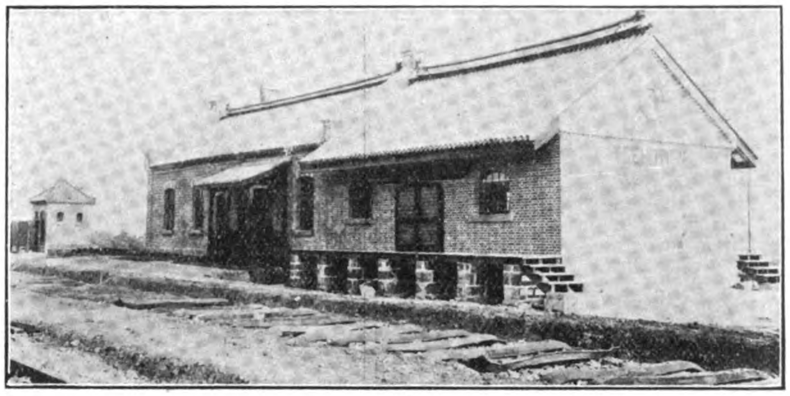
THE TSINGTAO-TSINANFU RAILWAY.—Waterway at kilometre 243



MAP OF THE TSINGTAO-TSINANFU RAILWAY



THE TSINGTAO-TSINANFU RAILWAY.—Abutment of bridge at kilometre 365



THE TSINGTAO-TSINANFU RAILWAY.—A third class station

Earthwork.—As far as possible excavations of any considerable depth were avoided owing to the great friability of the soil. No tunnels were necessary.

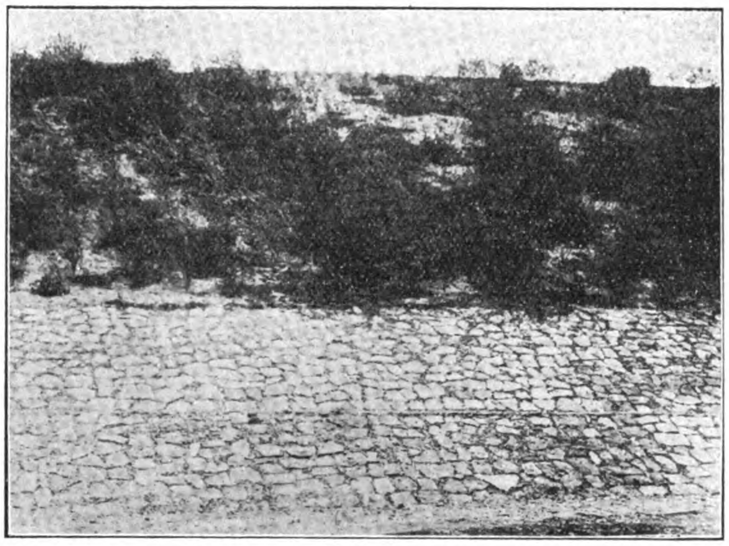
Embankments are protected against the ravages of heavy rains and floods by heavy stone reinforcements at the base, in addition to which the sides have been protected with sod, and trees such as willows, acacias and alders.

Ballast.—The stone ballast is 4.50 metres wide, and consists either of broken stones (granite or black lime stone) or of pebbles, and is at least 35 centimetres thick.

Bridges and Culverts.—The total number of bridges and culverts along the line is 1,330. Of these 1,150 are iron bridges, and 280 arch stone culverts. The latter vary in length, the maximum being six metres. The total length of all such culverts on the line is 640 metres.

The spans of the iron bridges vary from one metre to 46 metres, and their total length is 7,700 metres. The longest bridge is over the Tse-ho, 258 kilometres from Tsingtao, the length being 470 metres. The number and dimension of the bridges more than 50 metres long are as follow:—50 metres to 100 metres, seventeen; 100 metres to 200 metres, three; 200 metres to 300 metres; five; 470 metres, one.

Masonry.—The total mason work on bridges and culverts amounts to 210,000 cubic metres. The foundations of most of the large bridges are laid upon iron piles 12 to 14 metres long. In a few cases the foundations rest upon caissons.



THE TSINGTAO-TSINANFU RAILWAY.—Retaining wall work

Rails and Ties.—The normal length of the iron rails is 10 metres, and the weight 300 kg. each. The ties are of steels, weighing 50 kg. each. The material was all bought in Germany. The rails are ten centimetres wide at their base, 5.7 centimetres at their top, and are 12.50 centimetres high. The ties are 2.40 metres long and 8 centimetres high.

Stations.—There are 55 stations for all kinds of traffic on the main line, and four on the branch line to Poshan. Besides these there are five stations at the end of short branches for receiving cargo only.

The majority of the stations have goods sheds. Some important stations have two, the total number of all sizes being 32. European station masters are in charge at Tsingtau, Kaumi, Fangtze, Changtien, and Tsinanfu West.

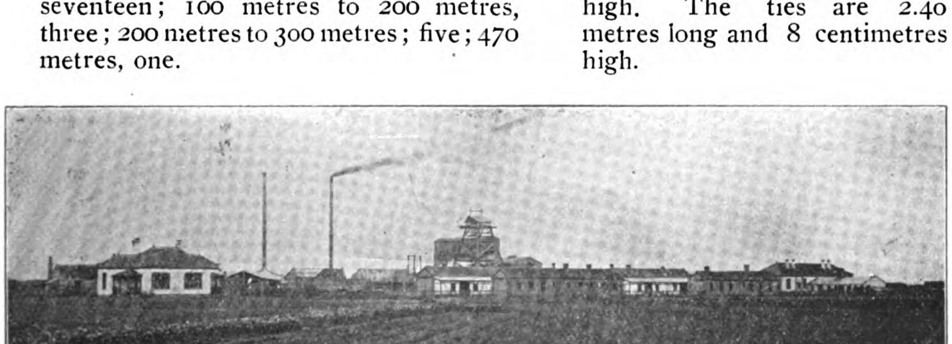
Round Houses.—There are 16 round houses, with capacities varying from 4 to 12 locomotives. The round houses at Tsingtao, Kaumi, Fangtze, Chang-tien, and Tsinanfu are under European control.

Turn-Table.—There are eight turn-tables with an inside diameter of 17.50 metres each.

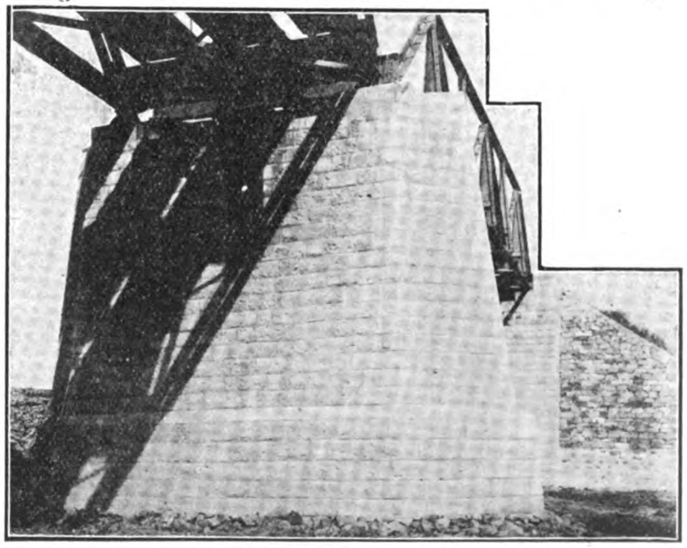
Tank Houses.—There are 20 tank houses with water tanks of from 40 to 80 cubic metres each.

Platform Scales.—There are twelve platform scales of 55 tons capacity each.

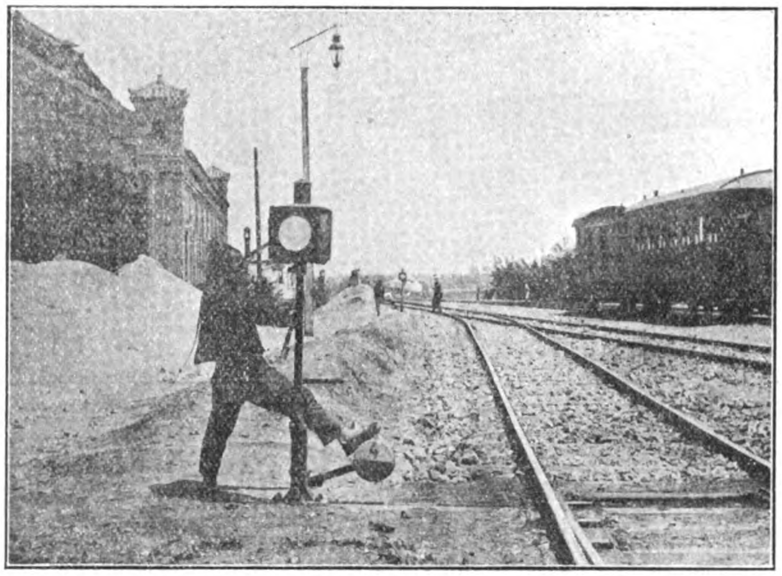
Work Shops.—Large work shops and magazines are situated at Syfang, near Tsingtao, and are fitted with the best and most modern machines, operated by electricity. They are capable of effecting



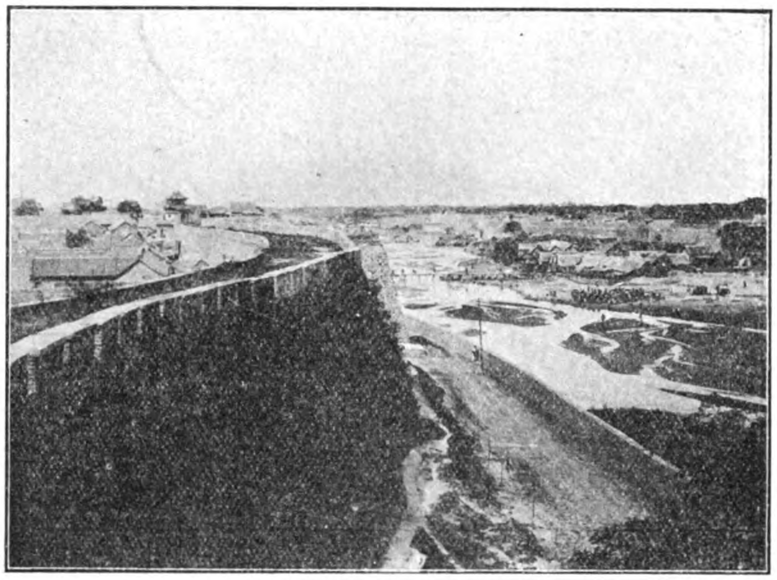
THE TSINGTAO-TSINANFU RAILWAY.—The coal mine at Fang-tse



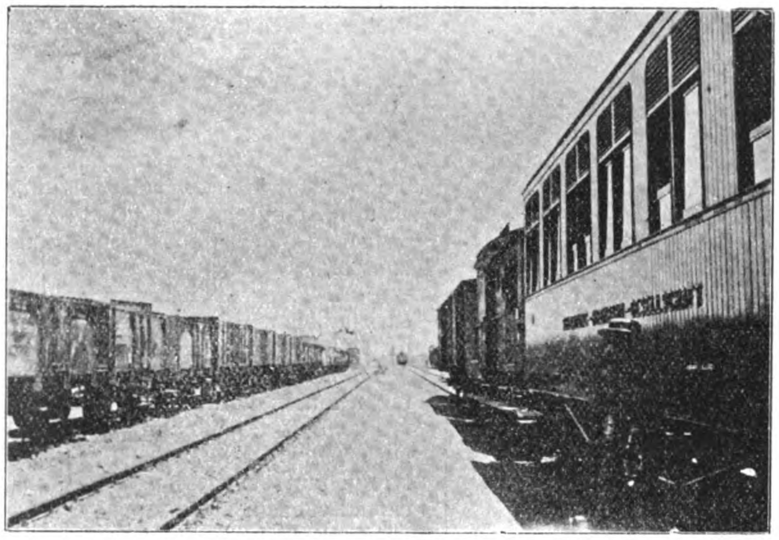
THE TSINGTAO-TSINANFU RAILWAY.—Stone pier of bridge at kilometre 318



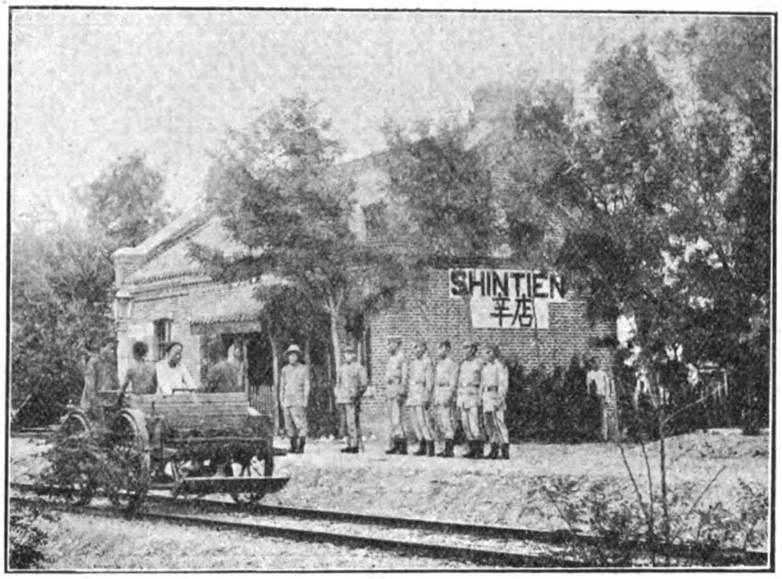
THE TSINGTAO-TSINANFU RAILWAY.—A pointsman at work



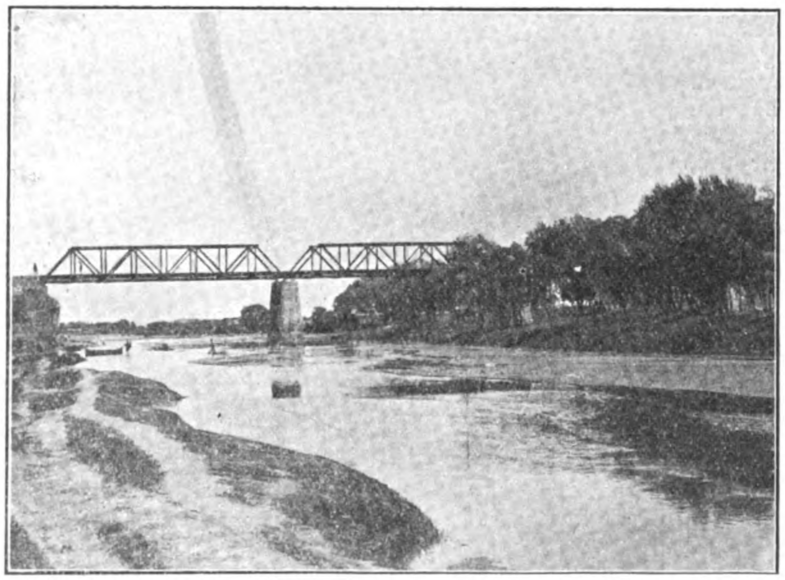
THE TSINGTAO-TSINANFU RAILWAY.—The Pailang river at Weihsien



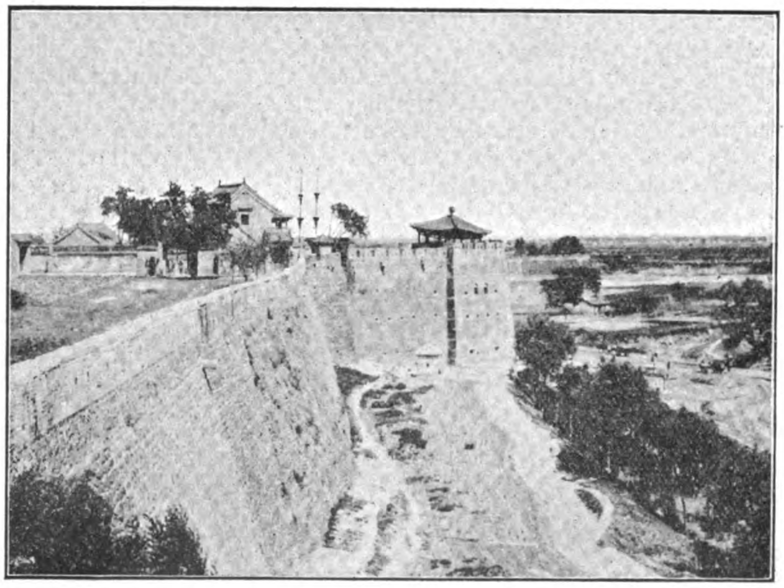
THE TSINGTAO-TSINANFU RAILWAY.—Tsingtao Train Yard



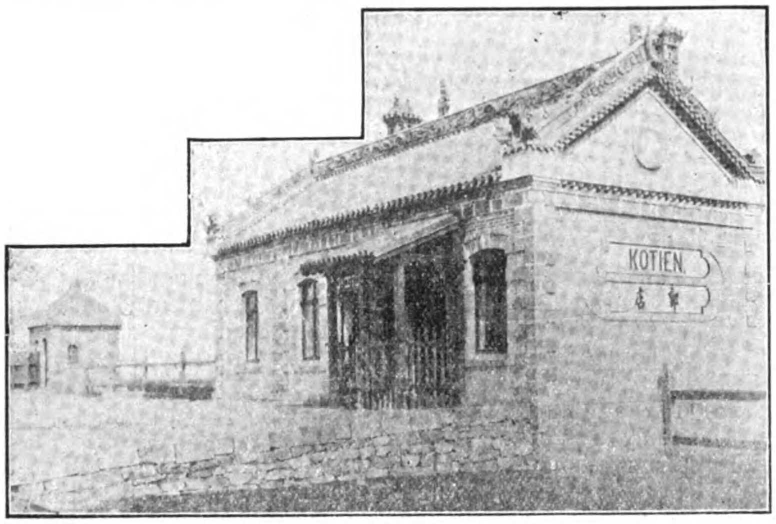
THE TSINGTAO-TSINANFU RAILWAY.—Guard at Shintien station



THE TSINGTAO-TSINANFU RAILWAY.—A bridge over the Pailang-ho near Weihsien



THE TSINGTAO-TSINANFU RAILWAY.—The wall of the city of Weihsien



THE TSINGTAO-TSINANFU RAILWAY.—Fourth class station at Kotien

all necessary repairs, and most of the outfitting work can be quickly and efficiently done. The shops are under the direction of an engineer of the Imperial German Railways, who has under his control 16 Europeans and about 700 Chinese apprentices. The stations which are under the supervision of Europeans are able to effect small repairs to locomotives and cars. They engage in this work about 100 apprentices and laborers.

Rolling Stock—On December 31, 1912, the rolling stock of the railway consisted of :—

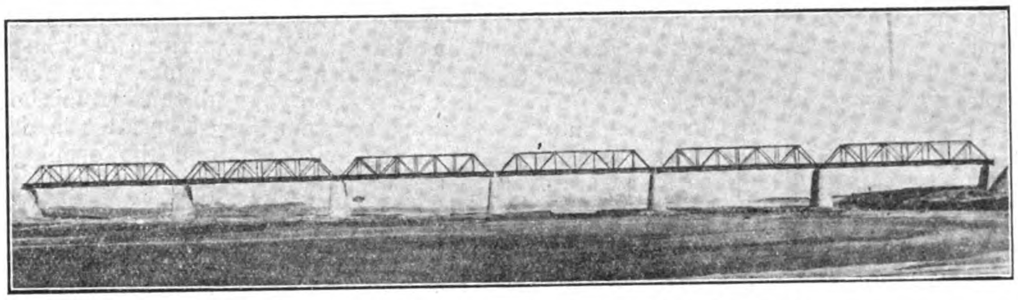
- 14 locomotives of German manufacture.
- 3 dining cars of the most modern construction.
- 1 luxus car.
- 1 inspection car.
- 67 first, second, and third class passenger cars.
- 30 mail and baggage cars.
- 3 kitchen cars.
- 1,057 freight and coal cars.
- 43 section cars.
- 17 hand cars.
- 2 railway bicycles.

Opening of the Line—The first section of 74 kilometres to Kiaochow was opened for traffic on April 8, 1901, and further sections were put into operation during the same year. On June 1, 1902, the whole of the first half of the line, as far as Weihsien, was opened for freight and passenger traffic, and on June 1, 1904, the whole line, including the Poshan branch, was opened.

Cost of Construction.—The entire cost of construction and equipment of the railway was 52,901,266 Marks.

THE COAL AND ORE PROPERTIES

The coal mines of the Shantung railway are situated at Fangtze, 178 kilometres from Tsingtao, on the main line, and at Tzechwan, on the Poshan branch.



THE TSINGTAO-TSINANFU RAILWAY.—The Taku-ho bridge

At Chinlinchen, 290 kilometres from Tsingtao, on the main line, there are extensive and rich deposits of magnetic iron ore, which are now beginning to be worked.

Other coal fields and ore deposits, for which the Company hold concessions, have only been located and prospected.

Fangtze Coal Mine.—The coal mine at Fangtze has three shafts, with an average depth of 250 metres. The equipment includes one large repair shop, with foundry and saw mill; one coal separator and loading station; one coal washer, with a capacity of 80 tons per hour; and one briquette machine with a capacity of 30 tons per hour. In Fangtze there are employed 25 Europeans and about 2,000 Chinese. The greatest yearly output was reached in 1910 when 273,354 tons were raised. The coal is of the same character as the Japanese gas coal and is used in the interior chiefly for household and locomotive consumption.

The Tzechwan Coal Mine.—At the Tzechwan mine there are at present three shafts in service, the greatest output of which is 250 tons per hour. The average depth of the shafts is 260 metres. The equipment is much the same as at Fangtze, with the addition of a large electric installation. Thirty Europeans and about 5,000 Chinese are employed. The highest yearly output was reached in 1912, when 360,000 tons were raised. In 1913 the output is expected to reach 400,000 tons. The coal from this mine is half-soft and of the same character as Cardiff coal. It is much in demand for naval and merchant ships.

THE TSINGTAO-TSINANFU RAILWAY.—Second class station at Tsongtschowfu

THE SALT INDUSTRY IN KWANTUNG

The whole extent of the salt fields which are devoted to the manufacture of salt in Kwangtung Territory measure about 2,800 *cho*, of which the Nippon Salt Manufacturing Company owns 1,000 *cho*, the Manchuria and Korean Salt Manufacturing Company, 600 *cho*, Suzuki & Co 80 *cho*, the remaining 1,000 *cho* being under the management of natives. The total amount of annual yield from these salt fields reaches as much as 200,000,000 lbs.

The salt manufacturing business in Kwangtung Province is a natural industry special to the province, and accordingly comes foremost among the other industries. The Government-General of Kwangtung is striving to encourage this branch of industry and the companies themselves are making great efforts for the expansion and development of the manufacture. The salt manufactured in these fields is expected to be sold to the Salt Office at Mukden from next year, and it is reported that negotiations have already been started for that purpose. Then at least forty or fifty thousand million pounds of the manufactured salt will be forwarded to Mukden province. The Nippon Salt Manufacturing Co., and the Manchuria and Korean Salt Manufacturing Co. are now hard to work in preparation for the extension of the salt fields.

It is reported that the new salt fields of the Nippon Salt Manufacturing Company cover an area of over one hundred *cho*. They have been under construction since last spring and will be completed by the early part of December.

The Nippon Salt Manufacturing Co. was to hold a general meeting at the end of November, when a dividend of 5 per cent. was to be declared.

THE CHEFOO BREAKWATER

Mr. Liedt-tede-Jende, the engineer who is to draw up a scheme for the forthcoming breakwater, has arrived in Chefoo. He is accompanied as Assistant, by Mr. von Exter.

The amount of the extra duties levied specially for the construction fund for the month of September last totalled Tls. 11,700, showing an increase of Tls. 2,100, over the previous month.

CHINA'S POLITICAL AND FINANCIAL PLIGHT

The varying phases which the political whirligig of China is constantly presenting are so bewildering to the casual observer that any attempt made by him to try and keep in intelligent touch with them is bound to be disheartening. Unexpected factors are incessantly interjecting themselves, and contribute to the wrecking of all deductions based on the standards usually accepted in other countries where politics have steadied down to at least a rule-of-thumb procedure.

In China the political chaos has not yet been mastered so that elements can be marshalled and catalogued to enable a reliable prognostication being arrived at. The possibilities of personal ambitions, individual influence, collective power in varying quarters, all inextricably mixed, must always be taken into account and be added to the intense feeling existing between the young and the old when any situation is being summed up with the object of arriving at an approximate idea of future prospects. The battle for power is not one between distinguishable leaders of recognised parties. First, it is between the young and the old; and second, it is between the varying degrees in both those camps.

By means of the revolution of 1911-12 the young ousted the very old as typified by the Manchus, but the Manchus carefully handed on their time-expired mandate from Heaven to the present President to found a Republic. The President is not of the young school. He is of the moderates of the old *régime*—a conservative with progressive tendencies as compared with the reactionary element with whom he used to be associated, but yet not progressive enough for the returned student faction who constitute the Young China party. With the mandate from the Manchus President Yuan Shih-kai has followed the course he deemed best for the interests of China as a whole; a course not in accord with the ideas of the young men, and which could not be accepted by them, while ever he showed a disposition to prefer the old-time officials with the administrative knowledge to the young untried citizens with booklore and ambition but no experience.

Patriotism is a word used glibly by both sides, but neither have yet accepted a definition which could be reconciled with the actions of the other. Conflict in ideas was inevitable. Antagonism sprang up immediately the Manchus abdicated in favor of Yuan Shih-kai as their agent for the establishment of a Republic. The young party decried the choice, were convinced that no constitutional government could thus be formed, and worked to overthrow any government not solidly in support of their ideals. Their opposition to Yuan Shih-kai was not successful, and he was elected by them. He proclaimed himself a constitutionalist, but early announced that his notions of what a Republic ought to be could not accord with those of his opponents, though he claimed that he would tolerate much of the agitation they evoked since it was only fit and proper that youthful spirits should effervesce.

Parliament was inaugurated on April 8 and at once trouble commenced. The Young China Party as represented by the Kuo Ming Tang were in the majority, and bade fair to rule on every measure if permitted to come to a vote. The Chin Pu Tang was formed to combat the aggressive ambition of the Kuo Ming Tang, and adopted tactics which quickly reduced Parliament to a farce. President Yuan was harrassed by what was described as the ineptitude of the parliamentarians; declared himself forced to take active measures in certain directions, and thereby laid himself open to charges of unconstitutionalism which eventually opened the way for a menacing revolt. The movement of troops by the President into areas of a recalcitrant disposition was the match which lit the gunpowder train in the Yangtsze Valley, and the abortive insurrection was the result.

President Yuan was able to solidify his position by swiftly crushing the rising. Men like Sun Yat-sen, Huang Hsin and others who proclaimed themselves against him fled to other countries, and the Kuo Ming Tang, to which they belonged, remained charged with elements of a minatory nature, though obviously chastened. The members of Parliament who gave allegiance to the tang were not by any means all revolutionary. Only a small percentage favored the revolt. The majority were opposed to it and were active in their operations against it. They, however suffered by their connection with the birds of the other feather, and being known for their opposition, constitutional or otherwise, to the President, they were marked.

The drafting of a Constitution designed to deprive the President of power to rule in any shape or form, combined with stedfast opposition to the President having any voice in the shaping of this instrument, brought out the older school in opposition to the young men entrusted with the work, and messages from Tutuhs and others to the President urging the dissolution of the Kuo Ming Tang in particular and Parliament in general, incited though they were by a set of queries from Peking, were complied with on November 4 by the issue of Mandates dissolving the Kuo Ming Tang and depriving the members of the party in Parliament of their seats. Certificates of election and badges giving admittance to Parliament house were collected on the evening of the 4th by the police, and very soon 438 members out of a total of 870, found themselves unable further to participate in parliamentary business, whilst members of other parties who secretly exulted at the fate of the Kuo Ming Tang ultimately made the painful discovery that this blow had likewise deprived them of their parliamentary occupation, for a quorum could not be found in either the Senate or the House of Representatives.

Parliament as an immediate legislation creating institution thus received its death blow, or at least a blow which laid it *hors de combat*.

Merchants and others who had suffered bitterly by the disorganisation of commerce and the unsettled state of the country since the Revolution hailed this exhibition of the mailed fist with delight, seeing in its use a hope for the permanent removal of disaffection, a chance of a return of security, and a distinct promise of a general resumption of business, a development of industry, and the opening of new avenues of employment.

Among the Young China Party the feeling was one of despondency, the moderates among them alone being able to view with calm the blow at their cherished hopes for a thoroughly constitutional state. The wiser element of the overthrown theorists accepted the *coup* as the inevitable result of the misguided rebellion, and expressed contentment to permit the President to demonstrate that he was right in his views by inaugurating an era of progress in place of the past two years of conflict and practical deadlock.

In foreign commercial circles there was approval of the mailed fist policy. Foreigners do not concern themselves as to whether the action was constitutional or not; that in their opinion is a matter for the people of China themselves. What the foreign merchants want to see is a strong central government with a settled country so that trade and commerce may develop. How that state is secured is a matter of indifference to them. They regard the parliament as constituted under the Republic a failure; they are ready to see the President take the widest power to restore order and give peace and security to the citizens. In this view, too, they find support among the foreign diplomats.

Foreigners who are not in commerce, but who take a close interest in Chinese politics, hold different ideas. They see in

the overthrow of the Young China Party the possibility of further strife, the creation of a bitterly hostile faction, and the conduct of secret campaigns to secure the downfall of the President. Others with a broader outlook consider that the hostility would have existed under any circumstances so long as Yuan Shih-kai was President, and regard the exhibition of a determination to put a period to parliament as likely to inspire respect that will ultimately make for a betterment of politics and a cleaning out of the irresponsible elements.

The establishment of an Administrative Conference to replace Parliament, or to act during the period which will expire before Parliament can be reorganised upon a more workable basis, seems to some a step in the right direction, though a danger that it will be ultra-conservative lurks in the stipulations of membership. On the other hand, if wisdom is shown in the selection of members it may prove to be more advantageous at this period than a parliament such as that which has been dissolved, but there must be wisdom. The qualifications for membership are such that the young Chinese are excluded. No one less than 35 years of age is eligible, nor is anyone qualified who has not had administrative experience. There are to be 71 members in all, and the appointments will be solely in the hands of the President through the Cabinet and the provincial Tutuhs. The President himself will appoint eight representatives, the Cabinet four, each Ministry one, and each province two. As previous administrative experience is one of the chief qualifications the men who will be appointed must be drawn from the ranks of the old official class. The duties of these men will be to reconsider the question of the advisability of Parliamentary government, and with what has happened since the establishment of the Republic poignantly in mind it is not likely that they will decide that Parliamentary government is particularly suited to China as it is to-day. In fact there is every reason to suppose that suggestions for Parliamentary revival will be looked at askance unless the provinces evince an unexpected and forceful desire for representation. In the mandate of November 26 calling the Conference together, the President stated that "The delegates to the Conference shall contribute their knowledge and assist in the administration, so that the country may be placed on a foundation solid like a rock, firm and unmovable, and the expectations of the people to see an age of prosperity may be realized." Not a word is mentioned about Parliament or the relations thereto of the Conference.

With this Central Administrative Conference, then, the President will be able to proceed to conduct affairs in China as he deems best suited to the needs of the country, and everyone will hope that he will perhaps be able to justify his actions by restoring order and placing the finances of the country upon a sound basis. It will enable him to insist upon provincial obedience in greater measure than he could have hoped for through a Parliament, however wise, and already he is trying to demonstrate to the provinces by commands to remit the salt revenues to the Central Government that he will not tolerate nonsense in the collection and handling of funds which rightly belong to the Central Treasury. The collection of provincial taxes and the remission of them to Peking are of the things that must be insisted upon if any Central Government is to live and have sway, and in taking steps to secure this end President Yuan Shih-kai is testing immediately the probable attitude of the provinces, and likewise demonstrating that he is determined to use the strong arm in securing obedience if there is any reluctance to obey exhibited. As the various Tutuhs are nominees of the President, they, at least, are likely to respond to the command, but it remains to be seen yet whether the recalcitrant people in the south will calmly obey and pay the dues which should be rendered the State.

Tradition has it that the Chinese people are ever respectful to a strong ruler, and if tradition holds in this case the taxes will come in and the Central Government will be able quickly to regain its feet. But the exhibition of force at a time when the populace believed that they had got rid of the domineering oppression of the Manchus and were to be permitted to bask under the warm sun of republican liberty, may have direful effects, and the danger of another revolution if too stringent pressure is suddenly brought to bear is the one thing which should carefully be kept in mind by the President. The rule of the mandarin is not forgotton, and its revival may be fraught with anything but good to China.

With the nullification of Parliament as a result of the overthrow of the Kuo Ming Tang, the Constitution Drafting Committee also collapsed. At the final meeting it was agreed that further progress was impossible, and members pathetically recognised that their past labors had brought nothing but Dead Sea fruit. If (with peculiar emphasis upon the *if*) a Constitution is needed for the Republic, said one of the members, the Administrative Conference will no doubt contrive one.

While there is pessimism in the Young China ranks with regard to the apparent failure of their efforts to introduce constitutional government it must not be forgotten that President Yuan Shih-kai has repeatedly asseverated his belief in such. Even in his mandates abolishing the party, and thus toppling Parliament and the Constitutional Drafting Committee in the dust of humiliation, he declared that he intended faithfully to adhere to his previous pledges. If that is so he will undoubtedly eventually have a constitution drafted which will give wider scope to the President than the young parliamentarians would be willing to accord, and perchance will adopt a much more workable instrument. In the preparation of a constitution the President will no doubt avail himself of the services of both Professor Goodnow and Professor Ariga, who were specially engaged for this work, and if they are given a free hand to make the draft China should secure a constitution compatible with her condition and circumstances of political life. Of course the Administrative Conference will be the body who will voice the decision as to whether there should be a constitution or not, but it is fair to take the assertions of the President that he believes in constitutional government as a true indication of his feelings and intentions.

As soon as the effect of the Mandates of November 4 were observed by the political parties untouched by them efforts were made to obtain from the President an order to restore certificates to Kuo Ming Tang members who had broken away from the party and were known to entertain no sympathy with the revolt so that Parliament could continue its sittings, and Vice-President Li Yuan-hung was prevailed upon to telegraph to the President in similar terms. The President, however, while not in cordial approval of the idea, listened to the overtures and appointed a committee of investigation, consisting of General Tuan Chi-jui, the Minister of War; General Chen Huan, Vice-Chief of the General Staff, and Luh Chien-chang, Chief of the Martial Court. These officers will examine into the claims of applicants for the return of certificates, and will decide unto whom clemency in this regard should be shown if, of course, this Parliament is to reassemble.

Both Speakers of the Senate and House of Representatives have been vigorous in their efforts to save the Parliament, and called a joint meeting of the remaining members of Parliament on November 13 to decide what should be done in the circumstances. Two hundred members, out of a total of 870, assembled and decided temporarily to suspend the present session. It was stated at this meeting that 470 members had been deprived of their certificates, and on the motion of one member present, who criticised the Government for crippling Parliament, it was resolved to interpellate those responsible with a view to ascertaining why the sweep of the net which dragged in the real culprits was so wide as to include others merely associated in name with the party and who in no shape or form approved the rebellion.

Parliament thus temporarily suspends business, and members are extremely curious as to the ultimate uses to which the Administrative Conference will be put. They ask already will it replace Parliament, or will it reorganise that body, but their fears are that it will do the former. The President, however, reassures them that the Conference will merely act till the new Parliament is in session,

and that thereafter it will be converted into a sort of Advisory Council which will act as a medium to prevent conflicts between Parliament and the Government! Generally it is believed that the members of this Council will, if a new Parliament is convened, be drafted into the Senate.

Just prior to the suppression of the Kuo Ming Tang the Cabinet had drafted its policy for presentation to Parliament, and actually had arranged to make it public on the very day the Mandates against the Kuo Ming Tang were published. Since the Cabinet still remains it is interesting to show what the members thereof contemplated and still contemplate. In so far as economic development is concerned the Cabinet appeared to have determined to proceed with a forward policy, and no doubt that section at least will still be gone on with. The President realises full well that everything depends upon activity in this respect, and since he must now justify in the eyes of foreigners the action he has taken it is extremely likely that a distinct move forward will be made in railway and industrial effort.

The Financial Situation

Of more importance than politics in the general situation at the moment is finance. The Central Government is without funds, and confronted with immense liabilities. The provinces fail to contribute their quota of revenue, and foreign loans cannot be secured unless under most objectionable conditions to the Chinese. Foreign loans must, however, be obtained somehow, and agents of the Government are active to discover a source which will provide money without conditions that are harrassing.

In an endeavor to stir the provinces to a sense of their responsibilities and duty the Minister of Finance recently telegraphed to all the Tutuhs, the state of the Treasury, and what the Minister had to say is worthy of reproduction since so much hangs upon the financial condition of the country. After a few words in which he follows the usual course of decrying his merits Mr. Hsiung Hsih-ling says :—

"During the Ching Dynasty, the provinces were required to send definite sums to the Central Government every year. With the inauguration of the Republic, the remittance has ceased. Although this Ministry has sent telegram after telegram asking for funds, we received cold response. Beginning with January of the first year of the Republic up to this moment, we have only received $2,600,000 from Shantung, Honan, Hunan, Kwangtung, Kiangsi and other provinces. This small sum of provincial revenues was far from enough to relieve the financial embarrassment of the Government. Since the Government cannot get enough money from the provinces, it is forced to turn its attention to foreign loans in order to eke out its existence. The Crisp Loan and the Reorganization loan were thus contracted. The Government is keenly conscious of the fact that "it is just like drinking poison in order to quench its thirst." But how can the Government possibly avoid this disastrous course of action? I have calculated and found that during the last year the Government has paid sixty million dollars ($60,000,000) for interest, discount, commission, exchange fees and the like on loans alone. The terms of the Reorganization loan were most severe and the expenditures were strictly supervised. As a result, China feels very uneasy under this financial burden. But if this loan will tide over the financial difficulties until the time when we can secure our money from our own country, there will be some consolation, but in the Annexes of the Reorganization loan, it was explicitly stated that China should receive $55,000,000 as administrative expenses, which lasted until the end of September, 1913. Now all of this money has been received, and $20,000,000 set apart for the reorganization of the Salt Gabelle and for the indemnification of losses during the Revolution of 1911, and $10,000,000 for the disbandment of troops, are funds that cannot be drawn by the Government for administrative expenses.

"From now on I am at a loss to know where the Government is going to get money to pay the running expenses of the military and police forces. When I am thinking about this, I am despondent. Formerly the salt tax remitted to the Central Government from Fengtien, Chihli and other provinces served as a great relief to the Central Government, but with the conclusion of the reorganization loan, the salt tax was pledged as security and the Government could not draw any more money from that source.

"The provinces instead of remitting money to the Government frequently ask subsidies from it. Urgent telegrams asking for financial assistance are piled up high on my desk, but the Central Government cannot support itself. In consideration of the precarious conditions of the country, I cannot but devise means of relief. From the beginning of the Republic up to now, the Government subsidies to the provinces have amounted to $14,000,000. It also repaid for the provinces internal and foreign loans amounting to $13,200,000. It also repaid for the provinces indemnity amounting to $77,500,000.

"The situation in Mongolia and Tibet requires constant attention, and the transportation of military supplies and troops to the Northwest to strengthen the frontier defence also served to deplete the State Treasury. "The clever daughter-in-law cannot cook her meal without rice," but the Government is required to perform that miracle.

"The Government, in endeavoring to help the Provinces, has always entertained the hope that as soon as the difficulties are over, a more prosperous time will ensue. But alas! the Kiangsi rebellion broke out in July last, and another great strain on the state exchequer took place in the form of military expenditures involved in the suppression of the rebellion. Then a vast amount of money will be required in the reorganization work in the provinces effected by the recent trouble.

"Not counting the indemnity arrears between March and October of 1914, China has to pay $9,800,000. From the present month to June, 1914, China will have to pay the short term loans contracted at Nanking and other provinces amounting to $53,500,000. She will also have to pay the short term loans of $20,700,000. contracted during the Ching dynasty. Again, it has to pay instalments on the long term loans amounting to $34,160,000. All the sums stated above must be repaid by the Central Government. They involve the national credit, and any delay in repayment will cause grave danger, but where are we going to get the money?

"There are many other difficulties darkening the financial outlook of China. In the Ching dynasty it was a fact that the Central Government could not make two ends meet, but somehow it could find means to meet its obligations. It is really deplorable that once the form of government is changed, the financial spring dries up. If we do not seek to remedy this state of affairs, I do not know where and what the fate of China will be.

"There are two schemes for the reform of national finance. We must endeavour to increase the annual receipts. We must also try to decrease annual disbursements. The budget compiled by this Ministry for the second year of the Republic indicates that the total amount of the annual receipts of this country amounted to $646,358,109. But this figure was made up by the inclusion of stamp tax, income tax, title deed tax amounting to $8,960,000. It also includes internal loans of $129,800,000. Again, it includes the Quintuple and Austrian loans amounting to $199,000,000. It will be noticed that we cannot hope to secure all the money stated in the above items. We do not know whether we will succeed in collecting the stamp tax and other forms of revenues. We are also sceptical about the flotation of internal loans amounting to $129,800,000. If we fail in securing these sums, how are we going to meet the expenditures?

"Hereafter the provincial authorities must devise means to readjust the old taxes and create new ones. On one hand they must find out whether the people can pay additional taxes, while on the other hand they must consider the imperative necessities of the Government. In making up their budgets they must meet the expenses of their provincial administration with the income derived from revenues beside Customs and salt taxes which have been pledged as securities to foreign loans. In most provinces, we expect that their budgets will show a surplus after meeting all their expenses. This surplus must be remitted to the

Central Government to relieve its financial stress. Really I refuse to believe that such a large country like China with its abundant resources will fail in supporting itself. What we lack is systematic organization in national finance. Once this is effected, I do not believe that China will ever fall into desperate stress.

"The second scheme I wish to impress on the provincial authorities is the reduction of annual disbursements. In compiling the budgets for the second year, we have found that the provincial authorities often overestimated the expenses of their respective provinces. There are many superfluous organisations which should be abolished, and there are many projects that can be made to wait. The Provinces must try their best to cut down their expenses to the minimum.

"The general policy of the present administration has now been drawn up, and in the future the provincial authorities are expected to adhere to the broad principles laid down by the Government. They must help carry out the policy steadfastly and with the force of a thunderbolt.

"As I said before, the provincial governments should practise rigid economy. I will show you an instance to prove that it is quite possible to do so. Liu Chih-yuan, Civil Governor of Fukien, recently wired to the Cabinet stating that after the reorganization of the Governor's Office, only $120,000 would be required for running expenses instead of $270,000, That means a saving of $150,000. From this instance it can be seen that expenses of every province can be cut down in like proportion. There is nothing that can be called "impossible" in the world. It all depends upon the men.

"I reiterate that it is a deplorable fact for the Government to give subsidies to the provinces instead of receiving contributions from them. I warn you that if China persists in this course, she will become bankrupt.

"I exhort all the Tutuhs and Civil Governors of the provinces to co-operate with me and carry out these two schemes which I advocate. I urge you to adhere to the general policy drawn up by this administration. This is the only means of salvation for China."

Whether the provinces will readily respond to the strong appeal contained in this message, in view of the attitude of the President with regard to Parliament, remains to be seen, but the President has shown that he intends to make something more than an appeal if forced to it by recalcitrance.

The expenditure for the running of the ten Boards of the Central Government for the months from October, 1913, to June 30, 1914, is estimated at over seven millions of dollars, and unless the provinces come to the rescue bankruptcy is sure to be the end even so far as these departments are concerned, to say nothing of the meeting of the many obligations which the Government has upon its hands in the shape of loans. The amounts required by the individual Boards during the term mentioned are as follow:—

Ministry of Foreign Affairs, Salaries, $408,372. Running Expenses, 177,796. Miscellaneous, 34,800. Total, $602,968.

Ministry of Interior, Salaries, 432,396. Running Expenses, 61,940. Miscellaneous, 9,600. Other Expenses, 88,123. Total, 684,459.

Ministry of Finance, Salaries, 529,224. Running Expenses, 161,148. Miscellaneous, 9,600. Total, 699,972.

Ministry of War, Salaries, 1,099,479. Running Expenses, 118,292. Miscellaneous, 23,397. Total, 1,241,168.

Ministry of Navy, Salaries. 469,560. Running Expenses, 48,600. Miscellaneous, 193,060. Total, 711,220.

Ministry of Justice, Salaries, 375,732. Running Expenses, 44,786. Miscellaneous, 33,989. Total, 471,787.

Ministry of Education, Salaries, 362,998. Running Expenses, 47,772. Miscellaneous, 27,120. Other Expenses, 17,280. Total, 895,617.

Ministry of Agriculture and Forestry, Salaries, 339,040. Running Expenses, 46,414. Miscellaneous, 185,200. Other Expenses, 457,727. Total, 630,654.

Ministry of Industry and Commerce, Salaries, 353,976. Running Expenses, 76,750. Miscellaneous, 35,800. Total, 466,526.

Ministry of Communications, Salaries, 527,280. Running Expenses, 38,200. Miscellaneous, 13,600. Total, 579,080.

In the Board of Posts and Communications there has been a stringency for many months, and constantly the Government Gazette frequently contains lists of loan amounts which have to be met, but for which funds are unavailable. The obligations of this Board for the month of November on account of foreign and domestic loans totalled $2,602,243.75, for which the Minister of Communications had to make an appeal to the Minister of Finance. That official managed, on November 13, to make $1,922,243.75 available, and that sum was sent to the Board of Communications to assist in the liquidations of the current debts. The obligations to be met were:—

Honan National Loan, first instalment due on November 17, $700,000.

Shanghai-Nanking Railway loan, twentieth instalment due November 17, £72,500, with £181.25 expenses, or $799,493.75.

Canton-Kowloon Railway loan, thirteenth instalment, due November 17, £37,500, with £93.75 expenses, or $413,531.25.

Shanghai-Hangchow-Ningpo Railway Loan, eleventh instalment, £37,500, with £93.75 expenses, or $413,531.25.

Railway Redemption loan, fifth instalment, Yen 250,000, with Yen 625 expenses, or $275,687.50.

The above statement sets forth in detail what the Board of Finance claims to be the obligations of a domestic character which the Government has to meet. And from the declarations made by the Minister of Finance the time has arrived when the practice of borrowing in order to live must be ended. The Central Government must have of course, another large loan for administrative purposes, but if possible provincial borrowing will be restricted within certain limits; with this object in view the Minister of Finance has issued a set of instructions to the provinces, which, if obeyed, will ease the unsupportable burden which the borrowing mania bids fair to impose upon the shoulders of the country. The provincial officials are instructed as follows:—

"1.—No province will be allowed to contract foreign loans after June next year. 2.—With the exception of industrial loans, the amount of a loan should not exceed $3,000,000. 3.—The proceeds of the loans, should be used only for military expenses, returning overdue loans or paying other unavoidable expenses. The ordinary administrative expenses should be defrayed by the revenue of the province, and no loan should be used for administrative purposes. 4.—Before concluding a loan, the province should first report to the Ministry of Finance the source from which the repayment of the loan is to be made. 5.—No revenue which is included in the class of national tax should be used as security for loans by the provinces. 6.—Before signing a loan agreement, the draft of the agreement should first be approved by the Ministry of Finance. 7—A comprehensive and detailed statement of the expenditure of every loan should be submitted to the Ministry of Finance."

The Government's General Policy

In the course of a statement of general policy issued on November 21 the Government made the following interesting desclosure of conditions and intentions with regard to finances:

"The question which should be first settled in the reorganization of the internal administration is the national finance. The finance of this country is in a precarious state, and all patriotic citizens are acquainted with it. But what is the exact extent of the financial stringency, only the authorities know. We need only speak of the financial condition of the Central Government. To say nothing of the railway loans which should be repaid, the expenditures of the Government from October 1913 to June 1914 amount to $216,000,000. The average expenditure for each month is $24,000,000. The repayments on the foreign loans amount to $150,000,000, which means an average of $16,000,000 per month. We see that the foreign loans alone take up two-thirds of the administrative expenditure. Now let us examine into the national income. Beginning from January 1913 to the end of June, the national income amounts to $58,000,000 which means an average of $10,000,000 per month. Of that sum, $57,000,000 are salt and customs revenues, the monthly average of which amounts to $9,500,000. The salt and customs revenues occupy ninety-five per cent. of the total national income, but these two sources have been pledged as security against the long-term foreign loans. The proceeds are not enough to repay the principal and interest of these loans. How can the Government draw from it the fund for administrative and military purposes? If such financial difficulties are only confined to the Central Government, and if the provinces are in a better condition, we still need not be alarmed, but the provinces are also in the same plight. The financial burden of the Central Government should be evenly borne by the people of the whole country. This is a universal principle and all the foreign countries are

practising it. During the Ching Dynasty, China did the same thing. If we store our money in the provinces, the Central Government can rely on them as a kind of treasury from which to draw necessary funds, but with the establishment of the Republic, the provinces have suddenly ceased to remit either provincial revenues or the amount of indemnity assigned to them by the Manchu Government. Since the establishment of the Republic up to the present we have received only $2,600,000 from Shantung, Honan, Hunan, Kwangtung, and Kiangsi. Since the provinces do not share the financial burden of the Central Government, we expect that they would at least support themselves. Instead, the provinces are also in great financial difficulties. During the last two years, besides paying off the foreign loans and indemnities for the provinces, amounting to $77,000,000, the Central Government sent subsidies to the various provinces, amounting to $14,000,000. It has also repaid the provincial loans, amounting to $13,000,000. All this money paid by the Central Government is of an extraordinary nature, and the Manchu Government would not pay such money. And yet telegrams sent by the provinces asking for funds are coming in succession, and we believe that we will continue receiving such telegrams from the provincial authorities. Now the Central Government has no income and it has to rely on foreign loans for support. The provinces are seeking to divide the proceeds of the foreign loans with the Central Government. If this state of affairs continues, we will pile debt upon debt, and the tendency will be to make the whole amount of the national income to pay off the interest of foreign loans. If this state of affairs continues, bankruptcy is at the door. When this Administration first assumed its duties, the proceeds from the reorganization loan has almost been exhausted. It is the duty of the Administration to devise means to save the situation. We have already drawn up schemes for temporary relief and also for permanent relief. These two schemes will be carried out side by side. The scheme for temporary relief is to make a definite settlement regarding the income and expenditure of the second fiscal year. In the budget of the third year of Hsuantung of the Ching Dynasty (1911), it was stated that the annual income amounted to Taels 270,000,000, that the annual expenditure amounted to Taels 320,000,000. Although the budget showed a deficit, that deficit was not very large. There was no proper budget compiled for the period from January 1913 to June owing to the confusion in political affairs. Beginning from July, the financial condition was in a more stable state and the former Cabinet compiled the draft budget for the second fiscal year. The annual expenditure as shown by this budget suddenly jumped to $646,350,000. An attempt was made to balance the receipts and the expenditure. The amounts of revenue expected from the provinces were accordingly increased to $300,000,000, and the stamp and title deed and income taxes were also included in the budget representing $8,960,000, but still there was insufficiency. Therefore the former Cabinet included in the budget the proceeds from the reorganization and Austrian loans. It also included in the budget the six per cent. domestic loan, amounting to $230,000,000. The total of these items is $646,000,000. On the face of it, the receipts and expenditure are balanced, but we can clearly see that the figures in the income columns are fabulous. The revenues from the provinces amounting to $300,000,000, is based upon the budget for the fourth year of Hsuan-tung. It is impossible to secure this amount of money. Moreover the country has suffered from warfare and famine. The reckless issuance of banknotes has demoralized the market. The organs for the collection of taxes are not in working order, and as a result the receipts are far less than before. We cannot say if the stamp and other forms of taxes will get satisfactory results. If the banking organs are not firmly established, there is no hope for the flotation of the six per cent. domestic loan. Should we fail to secure all the money from the sources described, then the budget is only a name, and the country will be in great danger. Therefore when we took over the duties of the Cabinet, we tried to revise the budget. We realize that the budget is useless unless it is revised. No doubt it is a great shock to hear that the expenditure of this country have been suddenly increased to such a high figure as $640,000,000. But this high figure should not be taken as a bad sign for the future of China's finance, because when we examine into the nature of the expenditure, we find that it is only an exceptional phenomenon, which is only peculiar to this one year. Of $640,000,000, the loan repayments amount to $290,000,000. Of $290,000,000, $107,700,000 are for the arrears of the foreign loans and indemnities, which were brought over from the year before last. The short term loans which should be paid before June 1914 amount to $75,000,000, while the repayments on the long term foreign loans amount to $50,000,000 and on the indemnities amount to $30,000,000; on the reorganization loan, $13,950,000; on advances, $21,400,000. All the above sums, excepting $50,000,000 on the long term foreign loans and $30,000,000 on indemnities are special disbursements of the second fiscal year. Four months have now elapsed since the opening of the second fiscal year. $128,000,000 have been drawn from the reorganization loan for the repayment of the outstanding foreign loans, indemnities and advances. $50,000,000 can be drawn from the customs revenue, which may be applied against the long term foreign loans and indemnities. The deficit as it now stands amounts to $40,000,000 on indemnities and $80,000,000 on the short term loans. The Government intends to bring this deficit into a special account and to negotiate with the creditors with the view to contract a long term big loan, part of the proceeds of which will be used to cover this deficit. This course cannot be avoided. Thus the problem of the loan repayments is solved.

"The remaining questions which should be thoroughly considered are those connected with the administrative expenditure. In dealing with the administrative expenditure, we must make the disbursements balance with the receipts. We must energetically deal with the problem of the annual income. The provinces must be made to remit every cent of the central taxes they actually collected. On the other hand, we must exercise rigid economy in the administrative expenditure. The figures of the draft budget which can be relied upon are those dealing with the revenue and miscellaneous taxes, amounting to $317,000,000. From the records of the past years, we find that the customs revenues are clearly set down in the accounting books, but all the other items are not clearly denoted. The great defect with this country is the entire lack of system in financial matters. Corruption prevails, and there is no means of tracing the corruption. There is no adequate organ to supervise over and audit the accounts. Thus the people's burden is by no means lightened, yet the state treasury is not replenished. The fundamental solution lies in the purification of the magistracy. The officials in charge of tax collection must be made to account for every cent that passes through their hands. I will describe the detailed methods under the heading of the policy for internal administration. If the scheme is properly carried out, it will be possible to secure all of $317,000,000. We will make this sum a limit for the annual expenditure. The expenditure of the Ministry of Communications should be placed in a special account. Of $317,000,000, the salt and customs revenues amount to $140,000,000, which in accordance with the loan agreements are pledged as security to the foreign loans and should be deposited in foreign banks. The remaining amount which can be actually used for administrative purposes is $177,000,000. This sum must be used with the greatest care.

"What the country needs most at present is peace and order. When the country is settled down, gradually we can plan for the development of various activities. To maintain peace and preserve order we must have military forces. According to the budgets submitted by the Tutuhs and Military Governors of the various provinces, the military expenditure amounts to $250,000,000. The former Cabinet reduced the sums to $160,000,000, including the funds for disbandment. We propose to make a further reduction and set the sums at $110,000,000. The detailed scheme is described elsewhere. The administrative expenses will be reduced to such an extent as compatible with the preservation of order. We fix the expenditure for the Parliament at $2,000,000 for the whole year. The expenditure for the President's Office, the metropolitan organs, the Chinese legations and consulates abroad, the metropolitan police, the schools and metropolitan courts shall not exceed $36,000,000. The funds for the Manchu Court and banner soldiers shall be $10,000,000. The funds for the tax collection and other financial organs shall be $25,000,000. The funds for emergency shall be $4,000,000. The funds for the maintenance of the patrolling forces controlled by the Civil Governors are included in the military expenditure. The funds for civil and judicial affairs and education and industry of all the provinces shall not exceed $63,000,000. Thus the administrative expenditure is brought down to $140,000,000. The generals and Tutuhs of the various provinces should appreciate the difficulties of the country, and I am sure that they will not let the military expenditure exceed the specified limit of $110,000,000. The Parliamentary members who represent the people, know the hardship of the farmers and the provincial authorities also understand the position of the Central Government. I believe that they will also strive to keep the administrative expenditure within the bounds of $140,000,000. The total of these two figures is $250,000,000. When compared with the annual income there is only a deficit of $70,000,000. The Government will devise plans for the collection of new forms of tax within the year, and it will call upon the Parliament to pass the bills in regard to the collection of new taxes. Or we may again reduce the expenditure. Or again we may raise a domestic loan and ask the help of the people to tide over the temporary difficulty. We may adopt one of the three proposals, or we may carry them out simultaneously. When we have definitely decided upon a definite course, we will again come to the Assembly and report on it.

"In a word, the Government is striving to achieve two objects. Firstly, it is seeking to make the income actually meet the expenditure and to make a budget that is really balanced. Secondly, it will seek to avoid drawing from foreign loans to supply the administrative expenses. These two objects must be achieved if we desire to lay the foundation of financial stability. We know that these objects are hard to attain, but we will do our best.

"The above is a resume of our scheme for temporary relief.

"Now we will describe to you our scheme to effect a permanent relief. This scheme will be divided into three stages. First, the reform of taxation system. Secondly, the adjustment of the banking and currency system. Thirdly, the reform of the national treasury."

"If the taxation system is thoroughly reorganized, our annual income will be greatly increased. It is a well-known fact that the average amount of taxes paid by the Chinese people is lower than that paid by any other people. Although China has a population of four hundred millions, her annual income amounts only to $300,000,000. On account of the light taxation, the country does not have a sufficient amount of money to defray all her expenses. There are hundreds of forms of enterprise which should be undertaken, but which are neglected for lack of funds. But although the people are lightly taxed, they are not enjoying the benefits accruing from light taxation. This is because the taxation system is defective, and is contrary to taxation principles. Owing to the defective system, the interests of the nation are injured, while the people are by no means benefited.

"We aim at drawing up a proper and efficient taxation system for this country which shall be based upon sound principles of

taxation. But this cannot be achieved all at once. The practicable step will be to discriminate among the various forms of tax now being collected, and seek to abolish those that are inconvenient to trade and harmful to the people, and reform those that are convenient and rational. On the other hand, we propose to enforce new taxes which shall be based upon the "National Society" doctrine so that the income of the nation may be increased, and the people may receive indirectly the benefit.

"There will be fourteen classes of national tax; (1) Land Tax; (2) Salt Tax; (3) Title Deed Tax; (4) Building Land Tax; (5) Stamp Tax; (6) Production and Consumption Tax; (7) Tobacco Tax; (8) Wine Tax; (9) Mining Tax; (10) Traffic Tax: (11) Income Tax; (12) Legacy Tax; (13) Transit Dues; (14) Bank Note Tax. We will now describe the methods of collection and the prospects of these taxes.

"According to the provisional budget, the annual land tax amounts to $78,000,000. We are sure that after a systematic survey is made of the whole country, the income from this item will double the present figure. Of course we do not expect this to take place now. But we will increase it by a small percentage, and set the figure down at $80,000,000, which sum there is every possibility of collecting.

"The original estimate of the Salt Tax is $76,000,000. Should we change the present system and buy that salt at the place of its manufacture or collect the tax on the spot, we are sure that the receipts will be materially increased. For the present, we will unify the salt tax and we expect to secure $84,000,000 from this source.

"It is formerly calculated that the customs revenue amounts to $63,000,000. We propose to abolish the *likin* and increase the import tax. The foreign countries are in favour of this proposal. During the recent years there was a great change in the prices of the various commodities, and therefore the tariff should be revised. If these two proposals are adopted, we expect to receive $100,000,000.

"In the provisional budget the title deed tax amounted to $13,000,000. If the new inspection fee proposal is enforced, there will be an increase of $9,000,000, which will raise the original figure to $22,000,000.

"Formerly the Government imposed high taxes on the farming land, but it paid little attention to the building land. Should the tax on the building land be levied according to its current value, we hope to receive $6,000,000.

"After the *likin* is abolished, we can levy the production and consumption tax, which will probably bring to the State treasury $15,000,000. The proceeds at present from the wine and tobacco taxes do not exceed $100,000,000. If in the future we enforce the tobacco monopoly law, that sum may be trebled. But for the present, we will collect more systematically the tobacco, wine and special trading taxes. The increase will thus be $5,000,000, bringing up the sum to $15,000,000.

"The mining tax as estimated in the budget amounts to $1,000,000. Should we adopt a more liberal policy in respect of the mining enterprises and encourage the people to make investments, the total amount of the mining tax will be greatly increased. Even during the first or the second year we will receive $2,000,000. Among the traffic taxes which were formerly levied, the items which brought by far the largest amount of income were license tax and pawn-shop tax. Should we make some changes and slightly increase the permanent and provisional rates, we can expect $10,000,000 from these sources.

"The income tax is one of the best forms of taxation, but it is not easy to introduce it into our country. We will start levying the income tax from the employees of the public organs. A very light rate of the income tax will be imposed upon limited companies, and in levying it, we do not expect any substantial sum from them, but with the view of cultivating the habit of paying such a form of tax. This tax will yield the sum of $5,000,000.

"In levying the legacy tax the Government aims at the supervision of the transfer of property rights. I am sure that the people will not object to the levying of such a tax. We can at least expect $2,000,000 from this tax.

"Transit dues will be imposed on railways, tramways and shipping companies. We estimate that from this source we can get $3,000,000.

"The banknote tax will be levied at the rate of two per cent. on the reserve funds for the issuance of notes. We are now negotiating for a big loan, the proceeds of which will be used in withdrawing the irregular banknotes of the various provinces which have reached so high a figure as $150,000,000. Meanwhile we will use our efforts to secure hard cash. The banknote tax will at least amount to $3,000,000.

"The stamp tax, registration tax and fishing tax, amount to $5,000,000 per year.

"Besides these taxes, we will increase our national income by the monopoly of the sale of implements of weights and measures. This will give two advantages to the country. In the first place, it will unify the system of weights and measures, and secondly, it will increase the revenue of the Government. There are approximately 50,000,000 families in this country. If each family buys forty cents worth of the implements of weights and measures, the Government will receive $20,000,000.

"The issuance of marriage certificates is a necessity to the country. We will impose a very light marriage registration tax, and the people will not feel the effect of it. On each certificate we will levy one dollar. It is estimated that three million marriages take place every year in China, and thus the country would receive $3,000,000 from the marriage registration tax.

"The currency reform will be undertaken in all earnest, and new coins will be minted. A certain amount of copper subsidiary coins may be withdrawn, but there will be minted a large amount of silver and nickel subsidiary coins. During the first year it is estimated that at least $100,000,000 worth of silver and nickel subsidiary coins will be turned out by the Government Mint, and the Government will obtain a profit of $20,000,000 thereby. From State enterprises, public land, and interest on public funds, the Government will secure as designated in the original budget an income of $20,000,000, which may be still increased later.

"If the foregoing estimates are approximately correct, then the national income per year will be as follows:—

A.—Taxes

Land Tax	$80,000,000
Salt Tax	$84,000,000
Customs Tax	$100,000,000

(Note.—This figure is based upon the estimate after the raising of import tax and the abolition of the *likin*. If the import tax is not raised, then the *likin* will not be abolished, and the income from this source will remain the same).

Title Deed Tax	$13,000,000

(Note.—The fee for the inspection of title deeds is of a temporary nature. If it is properly introduced, there will be an additional income of $9,000,000 which, when added to the title deed tax, will bring the sum up to $22,000,000.)

Building Land Tax	$6,000,000
Production and Consumption Tax	$15,000,000
Tobacco and Wine Tax.	$15,000,000
Mining Tax	$,2000,000
Partial Traffic Tax	$10,000,000
Partial Income Tax	$5,000,000
Legacy Tax	$2,000,000
Transit Dues	$3,000,000
Banknote Tax	$3,000,000
Miscellaneous Tax	$5,000,000

B.—Miscellaneous Receipts.

Monopoly Sale of Implements of Weights and Measures	$20,000,000
Marriage Certificates.	$3,000,000
Profits from minting subsidiary coins	$20,000,000
Government enterprises, public land, etc.	$20,000,000
Grand Total	$406,000,000

According to the foregoing estimate, there is an increase in the annual national income over the provisional budget for the second fiscal year of $100,000,000. In my opinion, if the scheme for the reorganization of the taxation system is carried into effect, there will be a great increase in the income of the third fiscal year. On the one hand, we are devoting our energy to increase the income, while on the other hand, we will strive to reduce the annual expenditure. I do not think it is a difficult task to make up the estimated deficit, $70,000,000. Thus the position of the national finance will have a firm foundation.

"The sources of revenues as described above, according to economical principles, will gradually be increased of their own accord. If there is efficient direction, surely a great increase in the receipts will be the result. After a few years, perhaps there will be no necessity for creating new taxes or raising the tariff rate, while the receipts of the State treasury will be trebled. In the classics it is said: "As there are men so will there be land. As there is land, so will there be riches." It is unbelievable that China with so large a population, and with such a vast territory, has still to worry about her poverty. Take the example of Japan. Japan is so near to China and the standard of living of her people is approximately on the same level with the Chinese. We find that in Japan each subject bears an average financial burden of Yen 12 per year. Yet, at present, each citizen in China bears a financial burden of less than one dollar a year. If the economical status of the Chinese people is improved, and if the Chinese are made to bear the financial burden just like the Japanese people, there will be $5,000,000,000 as annual income for the nation.

"The Japanese Government monopolizes the sale of tobacco, and its profit per year amounts to $50,000,000. In China, we estimate that thirty million people smoke tobacco. If each person spends one dollar per month for his tobacco, the Government will receive $360,000,000 annually. The Japanese Government receives per year $10,000,000 from the mining tax. If China adopts an enlightened policy in regard to mining projects, the income from that source will be ten times more than that received by the Japanese Government. In other words, the Chinese Government will receive $100,000,000 from the mining tax alone. All the other forms of tax may be calculated on the same scale.

"At the present moment, most people are in despair regarding the financial condition. They find that the financial outlook is menaced by great confusion and uncertainty and therefore they aptly conclude that the financial situation of China is hopeless, and irremediable. But I look at it in a different light. If the national finance is properly reorganized, the financial outlook of China is just as bright as can be expected, and there is a great potentiality for the unlimited development of China's finance. I view the financial outlook with unbounded optimism.

The next point which I desire to make plain to you is the necessity of carrying out the reform in the banking and currency systems.

Our currency system is in great confusion. It causes great inconvenience to our business men, and occasions much adverse criticism from foreign merchants. There was much talk about currency reform during the last years of the Ching Dynasty, but nothing came of it. For the last two years, the provincial governments have recklessly issued banknotes, and panic often occurs on the market. The value of banknotes has been depreciated, and the people have suffered great losses. Because of the confusion in the currency system much undesirable manipulation in the exchange rate has been made possible, and officials who are in charge of the collection of taxes make profits for themselves without being detected. As a consequence of the depreciation of banknotes, the Government has to suffer severe

discounts in its receipts. There are many other evils besides. The present Administration proposes to remedy all these defects.

"The first question confronting the currency reform is the question of standard. Much controversy has been raised over this subject. We realize that the gold standard is one that follows the tendency of the world, but we must set the gold standard as an object to be attained at some future time. It is impracticable for China to adopt it at the present moment. We propose to adopt the silver standard. The first thing which we will do is to provide China with a unified national coinage. If we do not make the supply of silver coins exceed the demand of the people, it will not be difficult to change the silver standard into gold. We will expand the scope of the Bank of China and strengthen the credit on its banknotes, so that they may be used to collect hard casb. When there is an adequate reserve fund, and when there is only one kind of national banknote for the country, the circulation of the notes will be increased. The Government's bonds may be also used as security for notes issued. The banks of the country will be glad to accept the Government's bonds and from the sale of loan bonds, the Government will secure a large amount of income for the development of the administration. In this manner, we will directly reorganize the financial system while indirectly we will be helping the Government financially.

"The first step in dealing with the irregular banknotes of the provinces is to clear up the accounts. The Bank of China will take charge of the work of clarification. It will inherit the rights of creditors, and the obligations of the various banks, and the new notes of the Bank of China will be used in recalling all irregular banknotes. A definite period will be fixed within which all the provincial notes must be withdrawn. The face value of the irregular notes issued by the provinces amount to $200,000,000, but its market value only amounts to $130,000,000. Although this is a big sum, it is not hard to withdraw the notes if the plan is carefully mapped out. The task of withdrawing the banknotes will be easier than that undertaken by Japan or the European countries. But to do this, we must have a great sum of ready money, which will probably be secured from foreign loans.

"Briefly the scheme of the Government will be as follows: In dealing with the administrative expenditure, the Government will lay its plan according to the amount of money received. It will attempt to strengthen the financial foundation by adjusting the taxation system. The reform of the currency and banking system forms the basis for all the other financial reforms. Our only fear is that although we have good intentions, we may not have the strength to carry out what has been planned. There are some points over which I have some doubts. Firstly, we are anxious to know whether we can collect all the old taxes as scheduled. Secondly, we do not know whether we can realize our hopes in regard to the reform of the salt, customs and other taxes. Thirdly, we are not quite sure whether or not there will be obstacles to the operation of the retrenchment policy. After the carrying out of the retrenchment policy, we are not sure whether there will be bad effects resulting from it. In a word, all this is a most grave task, which cannot be undertaken by the Executive Department alone. I seek in all earnestness the sincere assistance and co-öperation of the Parliamentary members.

"The next topic to be considered is the military administration. In the budget prepared by the former Cabinet, the expenditure of the Ministry of War was $161,000,000, which sum was one-fourth of the total sum of all expenditure. If the items relating to the loan repayments were taken off, the military expenses take up actually one half of the total administrative expenses of this country. The disbandment of troops is recognized by all the officials and private citizens as a most important step to be taken by the Government. But there are two sides to one question. It is quite true that in making the military scheme for the country we must consider the financial resources of the nation, but on the other hand, we must not neglect the national defence. In every foreign country the amount of military expenditure is decided by the consideration of the military strength of the country which she wishes to guard against. All the foreign nations desire peace in the Far East. We also want peace so that we can quietly develop the country. Therefore I dare predict that in the near future there will be no war between China and any foreign Power. There is no need for China to make warlike preparations. For the present, the duty of our soldiers is to maintain peace in the country. In the foreign nations, the maintenance of order is entrusted to the police, but there are two difficulties for the acquisition of an efficient police force for the whole country. Firstly, we have no trained men. Secondly, we do not have money to equip them. According to the plan of the Government China must have five hundred thousand soldiers in order to preserve order. These soldiers shall be divided into two classes. The first class will be called the *Luchun*, who will be organized according to modern army methods, and will be commanded by the division commanders and other officers. These troops will be stationed at the important points on the frontier. They shall be controlled by the Central Government. The second class is to be called the *Chinpeitui* or the patrolling force to be placed under the command of the Civil Governors. These troops are to be distributed among the various districts, and their function is to suppress robbers. As stated above, the duty of these two classes of troops are to maintain order within the territory of China. In training the *Luchun*, we aim at the organization of a strong and effective army for the defence of the country. In organizing the patrolling force we aim at making the soldiers efficient policemen in the country. This, in short is the military policy of the country.

"Military education and the manufacture of military supplies are the most important factors in the military administration. We will devote our attention to these two matters so as to lay a permanent foundation.

"The post of the Tutuh is the same as the viceroyalty of the Ching Dynasty. As the Tutuhs concern both civil and military affairs, unnecessary obstacles frequently arise. We propose to divide the country into military sections and the Tutuhs will be appointed Section Commanders so that they may concentrate their energy upon the military affairs.

"As for the navy we will continue carrying out the schemes fixed before, and gradually we will plan for naval expansion as the financial condition of the nation permits.

"Industry and communication enterprises are two means of amassing the riches for the country. Our industry is in its infancy, and therefore we will adopt a protective policy. In view of the scarcity of money in China we will adopt an open door policy. The protective policy will be applied to the cotton, iron, silk, tea, and sugar industries, while the open door policy will be applied to the ordinary mining enterprises. We welcome foreign capital, because we calculate that from thirty to forty per cent. of the profit from the development of natural resources goes to foreign capitalists, while from sixty to seventy per cent. of the profit goes to the Chinese. We will be careful regarding State enterprise. The Government will only undertake such projects that must be managed by the State, while other business enterprises will be left to the people. The Government will not compete with them, but it will guide and encourage them. We will also take great interest in the development of the commerce of this country.

"China is an agricultural country. There are vast areas of uncultivated land which must be utilized. Our farming methods should be improved. Agriculture in the United States is highly developed and her products find a good market in Europe. The people are thereby enriched, and industry and commerce consequently prosper. We propose that as soon as the financial condition of this country becomes more stable, we will establish agricultural banks in all the provinces, so that poor farmers may borrow money to cultivate the land. The Government will also improve the irrigation system of the country. The above is an outline of our industrial policy.

"Railways, navigation, postal and telegraph administrations are yet in the budding stage, and great possibility lies before them. We will draw a comprehensive scheme and decide upon the order of development according to the relative importance. The most important thing is to train men for the work. They should be equipped with technical education. We will welcome the investment of foreign capital in communications enterprises, provided that there is no political significance. Special accounting methods will be employed by the Ministry of Communications because of the enormous amount of foreign loans connected with the railways and the like. All the accounts should be strictly supervised by the Government.

The above scheme is framed with a view to make China grow prosperous and strong. The policy will remain in name if we sit down and only talk about it. In order to stand up and carry it out, we must have men—men who are upright and honorable. If the official system is bad and if the men are not honest, although you have a very good policy, you cannot enforce it.

China's Short Term Loans

In addition to the known foreign railway and administrative loans China has a series of short term loans on her shoulders totalling some $76,365,298.36, the purposes for which they were floated being set down in the following interesting report which should be read in connection with previous statements published in the FAR EASTERN REVIEW. The report was issued by the the Minister of Finance and makes instructive reading. It is as follows:—

(*Continued on page 215*)

THE KAWASAKI DOCKYARD

Owing to the great activity in shipbuilding this year, the Kawasaki Dockyard, Kobe, has received many orders for construction both of warships and merchant steamers, say *The Japan Chronicle*. The supply of iron in Japan is insufficient to meet the requirement of shipbuilding, and the greater portion of the supply is looked to from abroad. Mr. Matsukata, the President, and Dr. Saka, the Chief Engineer of the Kawasaki Dockyard, have on several occasions visited the Imperial Iron Foundry at Wakamatsu, and as the result of their inspection, it is said the Dockyard has decided to start an iron foundry with a view to remedying the present deficit in the supply of iron and steel, and for this purpose the company has engaged some experienced engineers and operatives. We understand that the new enterprise will be started on a small scale at first by utilising the blast-furnace already erected at the Hyogo branch factory for making cast steel. First of all the manufacture of 3-inch bar iron will be undertaken. The works will be extended by increasing the capital or by other means when an improvement is seen in financial conditions.

The Dockyard proposes to convert its loan of Y3,000,000 into a foreign loan. The outstanding loan, we learn, has been negotiated on a commercial bill at a daily interest of sen 2.2, equal to about 8.03 per cent. In addition to this high interest, the company is put to the trouble of renewing the bill very often. To rid itself of these disadvantages, the company some time ago decided to convert the loan into debentures, but this was proved impracticable, since money was so tight. Hence it is proposed to borrow from abroad in the same manner in which the Oji Paper Mill and the Kanegafuchi Spinning Company borrowed through the medium of the Mitsui Bank, and the Ensuiko Sugar Company through Messrs. Samuel Samuel & Co.

CHINA'S POLITICAL AND FINANCIAL PLIGHT

SHORT TERM DEBTS OF THE CENTRAL GOVERNMENT OF CHINA.

(*Continued from page 214*)

1. In October of last year the Ministry of Finance printed and circulated for reference lists of old and new debts due for payment by the Central Government. During the considerable time which has elapsed since then the items greatly changed. This present revised list of debts due for payment prior to June, 1914, has, therefore, been compiled in order to make plain at a glance the full extent of our indebtedness as regards Short Term liabilities.

2. These lists are in the nature of reports and it is intended to keep revising them half yearly or every three months. They will be called "Reports upon the Short Term debts of the Central Government."

3. The items treated of in this compilation are limited to Central Government short term Domestic and Foreign debts. Other liabilities such as indemnities and foreign loans outstanding from the Manchu *Régime* due to the Hongkong Bank, Russian, French, British, and German Loans, supplementary British and German loans, the "Cassel" Loan, Loans from Arnhold, Karberg, etc., the Boxer Indemnity and loans contracted after the establishment of the Republic such as the "Crisp Loan," and the Reorganization Loan the principal and interest of which are payable out of Customs or Salt Revenues, or for which other and different plans have been devised, have not been included. In time separate reports of these will be compiled so as to differentiate them.

4. In addition to the Central Government short term debts herein included there are several kinds of advances such as the Belgian Advance of last year, the Quintuple Advances, and sundry sums obtained from Foreign Banks by various Ministries. Since arrangements have now been made with the Quintuple Groups to retain these advances out of the Reorganization Loan funds they will be paid off in full before long. They have all been expunged therefore from this compilation.

With regard to the details pertaining to theses advances and their amounts, there are separate statements showing how they are to be repaid out of Reorganization Loan Funds. A report upon them will be compiled as soon as the accounts have been made up by the Banks.

5. In the present compilation none of the amounts due for payment have been calculated beyond June 30th, 1914. In the case of payments due from the Budget for the Fiscal Year of the 2nd year of the Republic (1913-1914) the words "have already been included in the Budget" are added. Payments due and unpaid, or only partly paid before the date of the budget of the Fiscal Year, have been made into a special list which will be submitted with the Budget so that they may be considered as part of it.

6. In the case of Items in this present compilation which are not merely short term items but the payments of which extend over a number of years such as the Domestic Loans for military requirements, "Patriotic" Loan, etc., we have included the amounts of the annual payments in order to make the list complete.

7. The draft of this compilation dates from June 10th, 1913. All previous figures were reckoned and balanced up to this date. Additions, and subtractions since this date, and supplementary figures received from various Ministries, will be rectified when the next report is compiled.

8. In the present compilation the various debts, both new and old, are distributed according to the Ministry to which they belong so that a proper grouping has been made. Further, at the end of the list under each Ministry an itemized table and totals are given so that they can be checked.

9. In this present compilation, apart from amounts in silver dollars which are not converted, all amounts in Sterling, Marks and other foreign currencies have been converted into silver dollars in order to facilitate the matter of arriving at a single total.

1. Domestic Debts

A. Under the Control of the Ministry of Finance

a. Funds supplied by the "Kuang Chao Ch'ao" to aid the former Nanking Government. . . . . $ 1,244.— + Sh. Tls. 321,500.—

According to the accounts of the Nanking Treasurer the above funds were received between the 19th Jan., 1912, and the 25th of Feb., 1912. The original amount of the Sh. Tls. was 421,500, of which the Ministry of Finance, on the 22nd of May this year, repaid, Sh. Tls. 100,000.

b. Loans to the former Nanking Government by Chinese residing abroad . . $211,686.—+ Sh. Tls. 279,606,31

According to the accounts of the Nanking Treasurer the above funds were included in the National accounts when Ex President Sun handed over his accounts April 2nd, 1912.

c. Loan to the former Nanking Government by the Kiangsu Provincial Ry. Co. . . . Interest. Yen 225.000.—

The above item concerns a loan of Yen 2,500,000 contracted by the former Nanking Government with the said Company 29th Jan., 1912. Interest 7½ % per month due for payment last of May and last of November. The 3rd interest instalment due last of May this year has been paid. The int. instalments due in Nov, 1912, and May, 1913, amounting to $ 112,500, have been included in the Final Budget

d. Accumulated arrears due by the Ministry of Finance to the Bank of China :— . . . . Sh. Tls. 101,908.62

The above items are those given in the statement of the National Treasurer as the sums in arrear due to the above Bank. K. F. Tls. 1,496,215.80 $ 3,493,182.629

e. Funds repaid on behalf of the late Manchu Dynasty's Ta Ch'ing Bank by the Bank of China. 1st, 2nd and 3rd period's principal and interest. . . . . Tls. 3,564,430.931

According to a despatch from the Bank of China the amount of principal and interest of merchants' deposits and shares to be repaid on behalf of the former Ta Ch'ing Bank is Tls. 10,397,274,447. Merchants' Deposits of under Tls. 2,000 are to be repaid in one year and those of over Tls. 2,000 in three years. Merchants' shares are to be repaid within 4 years. The above (plan) was approved and referred to the Cabinet which decided that the matter should be undertaken by the Bank of China, who should be the receivers, issue deposit slips for the annual payments and also pay interest thereon at the rate of 5% p. a. It has also been approved that funds deposited by the "Ching chi Hsueh Hui," "Ming Te Ta Hsueh," "Shang chih Hsueh Hui," "Wu Tsu Ta T'ung Hui" and official deposits shall be converted into Merchant's deposits and be repaid by instalments in the same manner as Merchant's deposits. The funds of the "Shang Chih Hsüh Hui" and the "Wu Tsu Ta T'ung Hui," however, shall be repaid within 10 years. Moreover, the Bank of China shall compile a detailed list of the Merchant's deposits and Merchant's Shares and forward the same to the Ministry of Finance. Thus there is no great difference between the funds under the heading "Merchant's deposits" and "Merchants' shares" and loan funds and they should be repaid in full by annual instalments in order to inspire confidence. Funds due for payment for the 2nd and 3rd periods have already been included in the Final Budget. Herewith is appended a detailed list of these annual payments :—

Amortization table of the Merchant's deposits and Merchant's shares of the former "Ta Ching" Bank.

1913	March	Principal	and	Interest	. . .	Tls.	75,000.000
„	Sept. & Oct.	„	„	„	. . . .	„	3,433,180.931
1914	March	„	„	„	. . . .	„	56,250 000
„	Sept. & Oct.	„	„	„	. . . .	„	2,736,815.290
1915	March	„	„	„	. . . .	„	37,500.000
„	Sept. & Oct.	„	„	„	. . . .	„	2,805,818.257
1916	March	„	„	„	. . . .	„	18,750.000
„	Sept. & Oct	„	„	„	. . . .	„	827,824.282
1917	Oct.	„	„	„	. . . .	„	61,535.710
1918	„	„	„	„	. . . .	„	63,997.140
1919	„	„	„	„	. . . .	„	66,458.567
1920	„	„	„	„	. . . .	„	68,919.995
1921	„	„	„	„	. . . .	„	71,381.423
1922	„	„	„	„	. . . .	„	73,842.852
	Total	„	„	„	. . . .	„	10,397,274.447

f. Accumulated arrears due by the Ministry of Finance to the Chiao T'ung Bank. 2nd and 3rd periods interest Fcs. 750,000. With regard to this item the Ministry of Finance first received from the Chiao Tung Bank on the 11th of Nov., 1912 Fcs., 12,-500,000. Subsequently on the 11th of December of the same year an agreement was entered into providing for the repayment in 5 years: interest at 6% p.a. to be calculated from the dates when funds were handed over: that interest payments shall be made for the first three (30 in original. Translator) years every March and September and that in the 4th and 5th years principal shall be paid in instalments. Interest for the 2nd and 3rd periods has already been included in the Budget. Details of later annual payments are shown in the accompanying list :—

Amortization Table of Francs due to the Chiao Tung Bank.

1913	March	Interest	Fcs.	264,874.—
"	September	"	"	375,000.—
1914	March	"	"	264,874.—
"	September	"	"	375,000.—
1915	March	"	"	264,874.—
"	September	"	"	375,000.—
1916	March	Principal and Interest	"	3,375,000.—
"	September	" " "	"	3,285,000.—
1917	March	" " "	"	3,195,000.—
"	September	" " "	"	3,605,000.—
	Total	" " "	Fcs.	15,599,622.—

g. Accumulated arrears due by the Ministry of Finance to the Chiao Tung Bank . . . . $ 4,582,810.85
C. P. Tls. 825,486.79

The above amounts of $ and Tls. are those given in the list compiled by the Treasurer as accumulated arrears due up to the present time by the Ministry of Finance to the Chiao Tung Bank.

h. Additional arrears due by the Ministry of Finance to the Chiao Tung Bank . . . K. F. Tls. 1,300,000.—
Interest ,, ,, 22,230.—

In the Statement of the National Treasurer regarding the above item it is shown that interest commenced on March 5th, 1913, that the interest is 9% per month, payable at the end of April and further that the Interest due reckoned at 9% from March 5th to the end of April, amounts to K. Tls. 22,230.

i. Additional arrears due by the Ministry of Finance to the Chiao Tung Bank . . . $ 1,000,000.—
Interest „ 36,000.—

In accordance with the statement of the National Treasurer the above item dates from 25th April, 1913, and was for one month @ 9% interest per month. But it was found impossible to make the payment at due date. We have here temporarily entered the amount of interest due up to August 25th.

j. Accumulated arrears due by the Ministry of Finance to the "Pao Shang" Bank . . . £ 35,204: 16: 6
K. F. Tls. 4,533,881.63

According to the Statement of the National Treasurer the above are the amounts shown by a recent balancing of accounts with the above Bank.

k. Debt incurred by Ministry of Finance with "Pao Shang" Bank on behalf of others . . . . $ 1,000,000.—

The above sum was borrowed jointly from the above Bank of the Tu T'ung of Jehol and the Minister of Finance on the 24th January, 1913. The agreement was for 9% per month interest, but no arrangements have yet been made regarding payment of interest and repayment of principal.

l. Nanking Government public loan for Military requirements . . . . $ 7,028,655.20

The amount of the above public loan issued by the former Nanking Government was fixed at $ 100,000,000 at 8 % p.a. to be repaid in 6 years. Interest to be paid in February and August repayments of principal to commence from the 3rd year, ⅙ to be paid each February. But the loan not having been issued in full the value of the bonds issued only namely $ 25,102,340 is the figure included in the reckoning. The above amount has now been included in the Final Budget. The details of annual payments are given below:—

Amortisation table of Public Loan for Military requirements.

1912	August	Interest	$	1,004,093.60
1913	February	"	"	1,004,093.60
1913	August	"	"	1,004,093.60
1914	February	Principal and Interest	"	6,024,561.60
1914	August	" " "	"	803,274.88
1915	February	" " "	"	5,823,742.88
1915	August	" " "	"	602,456.16
1916	February	" " "	"	5,622,924.16
1916	August	" " "	"	401,637.44
1917	February	" " "	"	5,422,105.44
1917	August	" " "	"	200,818.72
1918	February	" " "	"	5,221 286.72
		Total Principal and Interest	$	33,135,088.80

m. Manchu Govt. short Term Public Loan . . C. P. Tls. 178,614—
Kuping Tls. 20,000—

The above public loan was issued by the Manchu Government. Interest was 1 % per month. The amount of the loan was not settled. Actual funds received were C. P. Tls. 269,914. Kuping Tls. 30,000, $400. Interest has now ceased and the principal is to be repaid by annual instalments. With the exception of C. P. Tls. 91,300, $400, and Ku Ping Tls. 10,000 repaid in April of this year, the balance was due in May any June and was paid by the Bank of China, but the Ministry of Finance has still to pay them.

n. Manchu Government "Patriotic" Loan arrears of interest due to the Imperial Treasury for 1st, 2nd, and 3rd periods and the whole of the interest for the 4th and 5th periods. . . . . $ 1,439,137.05

The above public loan was issued by the late Manchu Government and taken over by the Ministry of Finance. The amount fixed was $30,000,000. Interest 6% p. a. repayable in 9 years. For first 4 years interest to be paid annually on the 11th May. Beginning from the 5th year ⅕ of the principal to be repaid until the 9th year, when the whole would be repaid. But the full number of bonds were not sold, and their issue has now ceased. Only the actual receipts, namely $11,281,980 have been reckoned. The amounts due for interest for the 4th and 5th periods have been included in the Final Budget. But there is still owing to the Imperial Family previous to June, 1913, for the 1st, 2nd and 3rd periods $762,218.25 interest on public bonds purchased by them.

Amortisation table of the Patriotic Loan.

1912	May	Interest	$	183,006.20
1912	November	"	"	338,459 40
1913	May	"	"	183,006.20
1913	November	"	"	338,459.40
1914	May	"	"	183,006.20
1914	November	"	"	338.459.40
1915	May	"	"	183,006.20
1915	November	"	"	338,459.40
1916	May	"	"	183,006.20
1916	November	Principal and Interest	"	2,594,855.40
1917	May	" " "	"	270,767.52
1917	November	" " "	"	2,527,163.52
1918	May	" " "	"	203,575.89
1918	November	" " "	"	2,459,971.89
1919	May	" " "	"	135,383.76
1919	November	" " "	"	2,391,779.76
1920	May	" " "	"	67,691.88
1920	November	" " "	"	2,324,087.88
		Total	$	15,865,958.90

o. Money due by Nanking Government to the Shanghai Chamber of Commerce. . . . . . . $ 3,000,000.—
Interest „ 210,000.—

The above represents monies borrowed from various Shanghai Merchants by the Shanghai Military Tutu. The Ministry of Finance on the 30th of Dec., 1912, issued in respect of this amount Treasury Bills for one year, interest at 7% p.a. The principal and interest are due for payment on the 30th Dec., 1913, and have been included in the Final Budget.

p. Money due by the Ministry of Finance to "Kailan Mining Administration" Head Office . . . . Hong Hua Tls. 250,000.—

The above was borrowed from the Banque de l'Indo Chine by the Liquidation Office of the Ta Ching Bank on behalf of the Ministry of Finance. The interest is 8% p.a. This was due in Feb., 1913. The interest due was paid in full long ago.

q. Loan made with the Bank of China by the Ministry of Finance on behalf of Anhui Province . . . . $ 130,000.—
Interest „ 6,240.—

The above loan was made with the Bank of China by the Province of Anhui, and the Ministry of Finance jointly June 26th, 1913. The original amount was $260,000. interest 9% per month: period 6 months. The agreement stipulated that when due the Province of Anhui and the Ministry

of Finance should each repay $130,000. This has been included in the Final Budget.

Table of domestic debts under the control of the Ministry of Finance.

Dollars	22,138,955.729	= approx.	$	22,138,955.729
Sh. Tls.	703,014.93	= ,,	,,	963,130.454
Yen	225.000.00	= ,,	,,	225,000 000
K. Tls.	7,352,327.43	= ,,	,,	10,660,874.773
Taels	3,564,430.931	= ,,	,,	5,020,325.255
Francs	750,000.00	= ,,	,,	324,000.000
C. P. Tls.	1,004,100.79	= ,,	,,	1,414,225.465
£ Sterling	35,204-16-6	= ,,	,,	352,048.250
Ku Ping Tls.	20,000.00	= ,,	,,	30,000.000
Hong Hua Tls.	250,000.00	= ,,	,,	375,000.900
Approximate total			$	41,503,560.926

B. Under the Control of the Ministry of War

a. Indebtedness of the late Nanking Government to the Lung Hua Co. for bedding and clothing . . . . $ 1,366,444.60

With regard to this item a recent list forwarded by the Ministry of War contained an account for $1,446,444.60, for which $1,000,000 of public bonds had been given as Security. On the 31st May this year $50,000 was repaid and on June 6th a further sum of $30,000 was repaid.

b. Arrears due by the Ministry of War to the Chiao T'ung Bank . . . . C. P. Tls. 500,000.—
Interest ,, 17,500.—

The above sum is a loan the agreement for which was made jointly by the Ministry of War and the Ministry of Finance with the said Bank on December 11th, 1912. The Contract stipulated that the Ministry of Finance was to be responsible for its repayment. The period was one year and interest 7% to be paid once a year. It has been included in the Final Budget.

c. Arrears due by the Ministy of War to the Chiao T'ung Bank . . . . C. P. Tls. 1,000,000.—
Interest ,, 80,000.—

The above is a loan the agreement for which was made jointly by the Ministry of War and the Ministry of Finance with the above Bank on Feb. 17th, 1913. The Ministry of Finance is responsible for repayment. The period one year. Interest 8%. It will be due for payment 16th Feb., 1914. It has been included in the Budget.

d. Arrears due by the General Staff to the Chiao Tung Bank . . . . Tls. 52,348.—

In the Statement from the General Staff details as to interest and period are not specified.

List of Domestic Debts under the Control of the Ministry for War.

Dollars	1,366,444 60	= approximately	$	1,366,444.60
C. P. Tls.	1,597,500.00	= ,,	,,	2,250,000.00
Tls.	52,348.00	= ,,	,,	73,729.577
Total			$	3,690.174.177

C. Under Control of the Ministry of the Navy.

a. Accumulated arrears of the late Manchu Dynasty to the "Yangtse Ship building Works" for Ships. . . . . Sh. Tls. 116,733.30
Interest ,, 7,003.998

With regard to this item on Feb. 20th, 1913, the Ministry of Finance arranged with the Ministry of the Navy to issue four Treasury Bills for one year at 6% p.a. interest. They are due to be exchanged for cash on Feb. 20th 1814. The principal and interest have been included in the Budget

b. Accumulated arrears due by the late Manchu Government to the "Kiangnan" Docks for ships. . . . . Sh. Tls. 1,164,187.50

As regards the above item a statement of the Ministry of the Navy says that it was due for payment Nov. 15th, 1912, and that its payment was urgently awaited.

c. Additional . . . . Sh. Tls. 30,000.—

As regards the above item the statement of the Ministry of the Navy is to the effect that it was Expenditure outside the original Contract for material and work connected with adding to the height of the bows and sterns of boats.

d. Miscellaneous Expenses of the Superintending Deputies at shipbuilding yards } Additional . . . $ 8,000.—

In the Statement of the Ministry of the Navy it is said that this item is for Expenses for uniforms, etc., of the Superintendents at various foreign yards, as reported by them.

e. Arrears due by the Board of the Navy of the late Manchu Dynasty to the "Yi Ch'ang Cheng" Firm, Shanghai. . . . . Sh. Tls. 46,934.771

The Statement of the Ministry of the Navy says that this sum was owed by the Board of the Navy in the late Manchu Dynasty and that its payment had been voted by the Cabinet.

f. Due to the office of the "Kiangnan" works by the Board of Navy of the late Manchu Dynasty. . . . . Sh. Tls. 47,902.04

The Statement of the Ministry of the Navy is to the effect that the above sum is owing by the Board of the Navy of the late Manchu Dynasty to the "Kiangnan" Docks for work and material on repairs to boats and that its payment has been voted by the Cabinet.

List of Domestic Debts under the Control of the Ministry of the Navy.

Sh. Tls.	1,412,761.609	= approx.	$	1,935,483.404
Dollars	8,000.000		,,	8,000.000
		Total	$	1.943.483.404

D. Under Control of the Ministry of Education.

a. Monies owing by the Ministry of Education to the "Pao Shang" Bank. . . . . $ 56,022.58

According to a letter from the Ministry of Education dated May 8th of this year this Ministry in August of 1912 entered into an agreement with the said Bank for the advance by it of funds from time to time to meet the fixed and current expenditures of the Ministry the rate of interest to be 7½% p.a. The above sum represents the amount of these advances to date.

b. Monies owing by the Ministry of Education to the Chiao T'ung Bank. . . . . $ 22,209.23

According to a letter from this Ministry dated 8th May this year an agreement was made with the above Bank on March 27th of this year for the Bank to advance from time to time funds required to meet the fixed charges of the Ministry. Interest was fixed at 7½% p.a. The above sum represents the total of such advances to date.

List of Domestic Debts of the Ministry of Education.

Dollars	$	78.231.81
Total	$	78,231.81

E. Under the Control of the Ministry of Industry and Commerce.

a. Monies owing from the last Dynasty Board of Agriculture, Industry and Commerce to the Chiao T'ung Bank. . . . . K. F. Tls. 30,000.—

The report of the Ministry of Industry and Commerce states that this item dates from the 4th Moon, 16th day "Hsin Hai" year (1911) and was due for payment 16/10 of same year, but has not yet been paid. "Han Yeh P'ing" Shares were given as security.

b. Monies owing by the late Dynasty Board of Agriculture, Industry and Commerce to the Chiao T'ung Bank. . . . . C. P. Tls. 30,000.—

The report of the Ministry of Industry and Commerce states that this item dates from the 13th of the 6th Moon "Hsin Hai" (1911) and was due for payment 13/12 of same year. It has not yet been paid.

c. Monies owing by the late Dynasty Board of Agriculture, Industry and Commerce to the "Ta Te Heng." . . . . Tls. 21,000.—

The report of the Ministry of Industry and Commerce states that this item dates from 1st day, 6th moon "Hsin Hai" year (1911), and was due for payment 1/12 of same year. Has not yet been paid.

d. Monies owing by the late Dynasty Board of Agriculture, Industry and Commerce to the "Hsin Ch'ang" Bank . . . . Tls. 68,132.—

The Report of the Ministry of Industry and Commerce ,states that this item is a loan contracted on the 13th Moon "Hsin Hai" year (1911—1912). "Han Yeh P'ing"

Co. Shares were given as Security. Date of repayment and interest uncertain.

e. Monies owing by the late Dynasty Board of Agriculture, Industry and Commerce to the "Chen Fa" Firm . . . . Tls. 311.80.

The Report of the Ministry of Industry and Commerce states that the above item consists of sums appropriated at various times during the 1st Moon of "Hsin Hai" year (Jan.-Feb. 1911). Date of repayment and interest uncertain.

The domestic debts of the Ministry of Industry and Commerce are for the most part old debts. The Ministry did not report upon whether or not it had itself arranged for the payment of any of the items. It seemed probable, however, that since the period covered was long, some alterations had taken place. In May last the Ministry of Finance wrote a letter of enquiry to which the Ministry concerned has just replied as follows:—"This Ministry has not itself arranged for repayment of any of its old debts nor has it contracted new debts. We would request, therefore, that you proceed in accordance with the statement rendered last year."

The sums included above are those given in the former Statement referred to.

List of Domestic Debts under the Ministry of Industry and Commerce.

K. F. Tls.	30,000.00	. . = . . approx. . . .	$	43,500.—
C. P. „	30,000.00	. . = . . „ . . .	„	42,253.521
Tls.	89,443.00	. . = . . „ . . .	„	125,977 183
Total	. . . .		$	211,730.704

F. Under the Control of the Ministry of the Interior.

a. Money owing by the Department of the "Peking Gendarmerie" to the "Heng Li" and "Yi Ch'ang" Bank. . . . . Tls. 34,055.—

The above item was reported by letter from the Ministry of the Interior, but no details regarding rate of interest and time limit.

List of Domestic Debts under the Ministry of the Interior.

Tls.	34,055.00	. . . = approx.	$	47,964.788
Total	. . . .		$	47,964.788

2. Foreign Debts.

A. Under Control of the Ministry of Finance.

a. Debt of Nanking Government to the "San Ching" Firm . . . . Sh. Tls. 630,000.—
Interest „ „ 8,400.—
„ „ „ 5,600.—
Yen 250,000.—
Interest „ 5,312.50

The above two items are accumulated arrears due by the Nanking Government to the above Firm. In September 1912 the Ministry of Finance made an agreement to be responsible for repayment. Several extensions were arranged up to March 24th of this year. Of the above item Sh. Tls. 350,000 bears interest at 8% a month and Tls. 280,000 is at 8% p. a. The interest on the Yen is 8½ % p. a. The Ministry of Finance has already paid in full interest due up to the end of May. The amounts given are the actual principal. No arrangements have yet been made regarding date of repayment. We have here taken as the basis for calculation of interest May 25th to August 24th in all three months interest.

b. Money due by the Nanking Government to the "San Ching" Firm. . . . . Yen 70,000.—

The above was borrowed from the above Firm upon the security of the "Han Yeh P'ing" Company. For overdue interest from February-August, 1912 see item below.

c. Money due by the Nanking Government to the "San Ching" Firm. . . . . Yen 2,000,000.—
Interest „ 140,000.—

The above loan was contracted by the Nanking Government on the 16th February 1912 and was due for repayment on the 16th of August of the same year. The property of the "Han Yen P'ing" Company was given as security and the interest 7 % p. a. The Ministry of Finance in September 1912 entered into an agreement to take over the liability. Several extensions were arranged up to January 24th 1913. But it was not possible to make the payment at due date. Interest from February 1912 to August 1912 is set forth separately. When the a/cs were made up to February 15th of 1913 there was still due Yen 70,000 for interest. We have here taken August 1913 as the date for interest payment when a further Yen 70,000 will be due.

d. Money due by the Nanking Government to the "Chieh Ch'eng" Firm . . . . . . Marks. 2,364,994.32
Interest „ 141,899.66

This item is part of a loan of marks 5,000,000 made by the Nanking Government on April 27th 1912, and represents the balance after deducting certain payments made after the Ministry of Finance took over the liability in October 1912 and made agreements providing for such gradual payments, extensions, etc. Interest at the rate of 1 % a month extended from April 31st (?) 1913 to October 29th 1913 has been included in the Final Budget.

List of Foreign Debts under control of the Ministry of Finance

Sh. Tls.	644.000.—	= approx.	$	882.280.—
Yen	2,465,312.50	= „	„	2,465,312.50
Marks	2,506,893.98	= „	„	1,253,446 99
			$	4.601,039.49

B. Under Control of the Ministry of Foreign Affairs.

a. Debt of the Former Dynasty Waiwupu to the "Lung Hsing" Company for funds in aid . . . . £ 81,510-6-10
Kuping Tls 250.000.—
„ „ 500,000.—

The original amount of the debt was K. P. Tls. 1,500,000 to be repaid in six instalments. No interest. Apart from one instalment already paid a Treasury Bill was given Sept 26th 1912 for the Kuping Tls. 250.000.00 due but not paid in March and Sept. of 1912. It was also arranged that the overdue interest, commission, etc., amounting to £ 81,510:6:10 should be paid in London on March 26th 1913. And further the amount due March 26th, 1913 namely K. P. Tls. 250,000.00 the K. P. Tls. 250,000 due in Sept. 1913 and March 1914 respectively have been included in the Final Budget.

b. Money owing by the Ministry of Foreign Affairs to the Banque Sino Belge . . . K. F. Tls. 60,000.00
Interest „ 1,361.096

The above loan was concluded by the Ministry of Foreign affairs in Feb. 1912 and was due in Feb. 1913. Interest was 9% p.a. A letter received from the Ministry concerned states that it has been arranged with the Firm to extend the time three months, making 6th of May 1913 the date for payment. On the 19th May a letter was received from the Ministry concerned stating that a further extension of three months had been arranged namely to August 6th. Calculating from May 6th three months interest is due as given in the figures above. Both principal and interest have been included in the Final Budget.

c Money due by the Ministry of Foreign Affairs to the Russo-Asiatic Bank. . . . K. F. Tls. 13,000.—
Interest „ 624.—

The above loan was contracted by the Ministry of Foreign Affairs Nov. 13, 1912. Interest @ 8% a month. Term Six months. On May 19th a letter was received from the said Ministry stating that an extension of six months had been arranged, making the date for payment 13th Nov. 1913. Interest to be paid accordingly. The Principal and interest of this item have been included in the Final Budget.

d. Money owing by the Ministry of Foreign Affairs to J. P. Morgan & Co., New York. . . . . Gold $ 185,000.—
Interest „ „ 11,100.—

The above loan was made by the said Ministry Jan. 16th 1913. Term one year: interest 6% p.a. payable once each half year.

c. Money owing by the Ministry of Foreign Affairs to J. P. Morgan & Co., New York . . . . Gold $ 200,000.—
Interest „ „ 12,000.—

The above loan was contracted on the 26th Nov. 1912: interest 6% p.a. Secured on the returned indemnity: no term fixed. In the figures above the interest given is that for one year. Principal and interest have been included in the Final Budget.

List of Debts under Control of the Ministry of Foreign Affairs.

£	81,510: 6: 10	=	approx.	$	815,103.417
K. P. Tls.	750,000.00	=	„	„	1,125,000.00
K. F. Tls.	74,985.96	=	„	„	103,728.389
Gold $	408,100.00	=	„	„	816,200.000
Total				„	2,865,031.806

C. Under Control of the Ministry of War.

a. Debt of Nanking Government to the "Ta Ts'ang" Firm for arms . . . . C. P. Tls. 440,000.—

The above is part of a debt of the Nanking Government of Tls. 543,420.—Interest 7½% p.a. It was extended from the end of Nov. 1912 to the 31st March of this year. The interest due and balance were paid still leaving unpaid Tls. 500,000. An extension for six months was arranged making the date for payment the end of September and it was also arranged that at the end of April, May, June, July and Aug. respectively Tls. 20,000 of the principal should be paid, interest on amounts paid to cease. The Tls. 20,000 due for payment for April, May and June have been paid in full. In addition to the Tls. 20,000 of the principal due for July and August respectively Tls. 54.201.367 for interest is due at the end of September. Both principal and interest have been included in the Final Budget.

b. Debt owing by the Ministry of the Army, Peking, to the "Li Ho" Firm (Carlowitz & Co.) for arms . . . . Marks 2,568,895.—
Interest „ 224,778.31

This item is a loan contracted by the Tutu of Chekiang Province on behalf of the Ministry of War. According to the statement of the said Ministry the loan dates from May 1912 and was for one year with interest at 7%. Calculating for the present for 1 year and 3 months the above amount of interest in Marks should be added.

c. Monies owing by the Nanking Board of War to Carlowitz & Co. . . . . Marks 2,000,000.—
Interest „ 80,000.—

This item dates from July 1912 when it was arranged with the Ministry of War, Peking, to give as security $1,600,000 of Domestic Bonds. Period one year, interest 8% p.a. Two interest coupons were also given amounting to Marks 160,000, payable in two instalments of Marks 80,000 in January and July 1913. The interest due in January has been paid. The interest due in July and the principal have been included in the Final Budget.

d. Debt of the Board of War of the Manchu Dynasty to the "Ta Ts'ang" Firm for arms . . . . Yen, 1,781,760.—
Interest 75,724.80

The above loan was contracted by the Board of War in 1911 12th Moon (Dec. 1911—Jan. 1912). The original amount was Yen 1,821,760 @ 8½% p.a. Security 22 deposit notes of the "Ta Ching" Bank. It was due 15th Dec. 1912. By arrangement between the Ministry of Finance and the said Firm one half of the whole sum namely Yen 910,880 was extended to March 15th 1913 and the remaining half was extended to May 31st. Subsequently it was further arranged to extend the payments due in March until May 31st. At that date one half of the three months interest due was paid and also $40,000 of the principal, leaving the above sums still unpaid. The whole of the interest was due on May 31st, but as yet no definite date for repayment of principal has been fixed. We have here reckoned upon the basis of six months and added interest as above.

e. Debt of the Board of War Nanking to the "San Ching" Firm for arms . . . . S. Tls. 86,000.—
Interest „ 3,440.—
Yen 79,500.—
„ „ 3,180.—

f. Debt of Board of War Nanking to "San Ching" Firm for bedding and clothing. . . . . $ 1,922,315.—

g. Debt of Board of War Nanking to the "Shou Wu" Firm for bedding and clothing . . . . . $ 13,016.—
Interest on above two items . . . . . $ 77,413.24

The above four items are accumulated debts of the former Nanking Board of War to the said Firm. In Dec. 1912 the Ministry of Finance made an agreement setting March 18th 1913 as the date for payment. Interest 8% p.a. The Ministry of Finance has already paid up interest due but as yet no definite date for repayment of principal has been fixed. Interest as given above is reckoned up to Sept. 18th.

h. Debt of the Nanking Board of War to the "Yi Ta" Firm for ammunition. . . . . Tls. 161,717.18
Interest „ 24,000.—

As regards the above item a statement of the said firm rendering accounts up to Nov. 26th 1912 the total indebtedness was Tls. 191,498.36. In addition there was overdue interest and expenses for telegrams in all Tls. 218.82. Deducting Tls. 30,000.00 paid by the Ministry of Finance on Nov. 26th the total indebtedness Dec. 30th was Tls. 161,717.18. Domestic Bonds 600 in number aggregating $600,000 were given as security and an agreement was made providing for half yearly payment of interest according to the face value of the Bonds, making a total of $24,000.00 interest due. Both principal and interest have been included in the Final Budget.

i. Debt of the Nanking Board of War to Carlowitz and Co., for arms. . . . . Marks 4,200,000.—
Interest „ 294,000.—

The Ministry of War reports that the above item is a combination of various debts for which a loan contract was signed in Oct. 1912. Interest 7%. Due for repayment Oct. 1913.

The Ministry of War has already issued 201 Treasury Bills in respect of this item, signed and sealed by the Ministry of Finance. Both principal and interest have been included in the Final Budget.

j. Monies owing by the Ministry of War Peking to the "Chieh Ch'eng Firm. . . . . . Tls. 213,675.00
Interest „ 3.205.12
Warehouse rent „ 1,378.283

The above item originally was a contract for purchase of arms by the Ministry of War, the whole amount of which was Tls. 203,500. On March 10th 1913 another contract was made stipulating interest @ 6% p.a. to be repaid April 30, 1913. Subsequently this was extended to July 31st, the Shanghai Branch of the Bank of China taking over the liability. All payments due 29th of July this year have been included in the Final Budget.

k.	Debts of the	Shanghai Arsenal	to	Arnhold, Karberg	Sh. Tls.	21,899.60
l.	do	do	do	"Shau Ch'en" Firm	do	24,244.348
m.	do	do	do	"Jui Sheng" do	£	20:11:4
	do	do	do	do	Sh. Tls.	65.00
n.	do	do	do	"Hsi Ming"	do	61,400.505
o.	do	do	do	Carlowitz & Co.	do	160,593.82

With regard to the above six items the statement of the Ministry of War gives no particulars regarding rate of interest, period, or purposes for which the sums were obtained by the Arsenal

List of Foreign Debts under Control of the Ministry of War.

C. P. Tls.	440,000.—	=	Approx	$	619,718.31
Marks	9,367,673.31	=	„	„	4,683,836.655
Yen	1,940,164.80	=	„	„	1,940 164.80
Sh. Tls.	357,643.273	=	„	„	489,971.284
£	20:11:4	=	„	„	205.667
Tls.	379,975.583	=	„	„	535,176.877
$	2,036,744.24	=	„	„	2,036,744.24
		Total	„		10,305,817.833

D. Under Control of the Ministry of the Navy.

a) Debt of the Manchu Dynasty Board of Navy to the "An-hsieh-tu" Works. . . . . £ 79,500:0:0

The above is an outstanding account on the price of ships due by the former Board of the Navy. The arrangement was for payment by instalments which are due in March, July and Nov. of 1913 and March and June of 1914, the amount due for each in-

stalment beihg £ 15,900:0:0. At the time when the March payment was due a dispatch was forwarded to the said Ministry instructing them to negotiate for an extension. No reply has yet been received. Apart from the March, 1913, instalment which has been entered in a special list instalments due July 1913 and subsequently up to June 1914 have all been included in the Final Budget. But as regards interest we have not received any report from the Ministry of the Navy.

b) Debt of the Manchu Dynasty Board of Navy to "Siemens" Work. . . . . Principal and Interest Marks 125,114.65

The above sum is due on various purchases made. The original debt was Marks 117,482.96 with interest at 8% p.a. When it became due in December 1912 an arrangement was made for an extension up to April 1913 and for the inclusion in the Principal of the four months interest due, making the total Marks 122,182.28 for which a note was given. Further, in April this year a further extension of three months was arranged and the interest rate changed to .008 per month. We calculate that three months interest is Marks 2,032.37. Both principal and interest have been included in the Financial Budget

c) Debt of the Manchu Board of Navy to Armstrong's Works for ships. . . . . £ 172,430:0:0
(?) Inspector's Fees. 918:0:0

The above item is outstanding on the price of a ship, the original figure being £ 135,000:0:0. Subsequently the Ministry of Finance on December 30th, 1912, issued to the above Firm 19 Treasury Bills aggregating £ 172,430:0:0. The bills were endorsed as payable at their full face value November 30th, 1913, without interest. £918:0:0 was added for Inspector's Fees. The whole item has been included in the Final Budget.

d) Outstanding debt of the Manchu Board of Navy to "Armstrong" Co. Works for guns and shells. . . . . £ 28,000.:0:0

The above item is an outstanding debt of the "Kiangnan" shipbuilding Firm for purchase of guns and shells. On January 28th 1913 the Ministry of Finance issued in respect of this sum six Treasury Bills aggregating £ 28,000:0:0 of which £ 14,000:0:0 is due 28th January 1914 and £ 14,000 : 0 : 0 on June 28th without interest. This item has been included in the Final Budget.

e. Outstanding debt of the Manchu Board of Navy to the New York Shipbuilding Co. for ships . . . . £ 85,146 : 13 : 4
Interest „ 5,108 : 15 : 11
In addition „ 90,000 : 0 : 0

f. Due to the same for transportation charges and gun mounts (?) (for racks?) . . . . „ 15,925 : 0 : 0

The above items are for purchase of ships etc. The original arrangement was for payment by instalments. Apart from the 1st instalment which has already been paid there is still outsanding £ 170,000: 0: 0 to be paid in four instalments. The 2nd and 3rd instalments of £ 40,000: 0: 0 each were due in January and July 1912, but it was not possible to make the payments. The Ministry of Finance in Dec. 1912 issued in respect of these payments 85 Treasury Bills in the sum of which was included the overdue interest thus making a total of £ 85,146 : 13 : 4. The date for repayment was fixed as Dec. 15, 1913, interest to be reckoned @ 6% p.a. The £ 45,000: 0: 0 due in each case in payment of the 4th and 5th instalments to await the result of the Ship's trials and her being taken over, before being paid. In accordance with the list furnished by the Ministry concerned the payments for transportation charges and for gun mounts (?) (racks?) should also await the taking over of the vessel. All payments due upon the above item have been included in the Final Budget.

g. Outstanding debt of the Manchu Board of Navy to "Shih-ti-pi-lu-mien-tu" Works . . . . £ 49,374 : 10 : 2.

The above item is an outstanding balance due by the Manchu Board of the Navy to the said works in connection with ships. It was originally arranged to pay by instalments. It has now been arranged by the Ministry of the Navy and the representatives of the said works that payment shall be made Dec. 15, 1913 without interest. It has been included in the Final Budget.

h. Outstanding debts of the Manchu Board of Navy to the "San-ling" and "Ch'uan-Ch'i" Firms "San-ling" . . . . Yen 340,000.—
"Ch'uan-ch'i" . . . . „ 340,000.—
Interest „ 44,200.—

With regard to the above two items it was originally arranged by the Manchu Board of Navy to pay by instalments. Apart from the 1st, 2nd and 3rd instalments which have been paid, the 4th instalment of Yen 146,000 was due March 16th 1912 and the last instalment of Yen 204,000 on November 16th 1912. But as it was not possible to meet these payments the Ministry of Finance on December 23rd of that year entered into an agreement with the said firms stipulating for a period of one year from the date of the agreement with interest 6½% p.a. and that interest unpaid prior to the date of the agreement and after the due date of payment of the price of the ships. should all be provided for payment by the Ministry of the Navy itself. The principal and interest due have now been included in the Final Budget.

i. Outstanding debt of Manchu Board of Navy to "Vickers" Works on account of ships . . . . £ 119,000 : 0 : 0

With regard to the above item in Oct. 1912 the Chinese Minister to Great Britain issued in London to the above Firm Treasury Bills for £119,000:0:0 to be redeemed without interest in London Oct. 31st, 1913. The item has been included in the Final Budget.

j. Outstanding debt of the Manchu Navy Board to the "Sho-Hsiao" works for ships . . . . £ 170,053:19:8

With respect to this item the Ministry of Finance in Oct. 1912 issued Treasury Bills stipulating for redemption on Oct. 1st 1913 without interest. The item has been included in the Final Budget.

k. Outstanding debt of the former Viceroy of "Hukuang" during the Manchu *Régime* to the "Ch'uan Ch'i" works for guns . . . . . G. Yen 968,798.40
Interest 67,815.88

The above item is a debt contracted by the Viceroy of Hukuang Provinces in the 32nd year of Kuang Hsü (1906) on account of purchases of guns. The account being overdue and it being impossible to pay it, on Feb. 1st 1913, the Ministry of the Navy entered into an agreement regarding it, the term of which was one year with interest @ 7% p.a. Principal and interest as above have been included in the Final Budget.

List of Foreign Debts under Control of the Ministry of the Navy:—

£	815,456:19:1	=	approx. . . .	$ 8,154,569.542
Marks	125,114.65	=	„ . . .	„ 62,557.325
Yen	1,760,814.28	=	„ . . .	„ 1,760,814.28
			Total	$ 9,977,941.147

E. Under Control of the Ministry of Education.

a. Loan made by the Chinese Minister to Great Britain with the Banque Sino-Belge, London, for educational expenses. . . . . . . £ 25,000:0:0

With regard to the above item the statement of the Ministry of Education is to the effect that it is money drawn from time to time from the above Bank by the Minister to Great Britain after the Revolution broke out. No period for repayment was fixed. The interest is 5% p.a. the dates of the various loans and the interest figures should be included when ascertained.

b. Loan made by the Chinese Minister to Belgium with the Banque Sino-Belge for educational ex enses. . . . . Francs 151,100.—

In accordance with reports made at various times by the Ministry of Education the Minister to Belgium has rendered a statement showing that the above is the amount of principal and interest due up to March 1st 1913. Some time ago a telegram was dispatched to the Minister to Belgium requesting him to arrange an extension,

but up to date no reply has been received. Details of the amounts of principal and interest will be added as soon as the Ministry of Education furnishes them.

c. Debt of the Ministry of Education, Peking, to the Banque Sino-Belge . . . . Francs 400,000.—
Interest „ 15,000.—

The above item is a loan made by the University, Peking, on the 15th Nov. 1912. The period was fixed at one year : interest 7½ % p.a., security the University buildings. The report of the transaction was filed with the Ministry of Finance and the Bureau of Audit by the Ministry of Education. The 1st instalment of interest Francs 15,000 was paid March 27th. Reckoning up to Nov. 15th 1913, in addition to the principal there will be due for payment Fcs. 15,000. Both have been included in the Final Budget.

d. Loan made with the Banque Sino-Belge by the official charged with the management of the expenditures for students residing in Europe . . . . £ 50,000.—

In the statement of said Ministry it is explained that after consultation the official charged with the management of the expenditures for students in Europe, Mr. Kao Yi was authorized to contract a new loan of £ 50,000:0:0 with the said Bank, at 6% interest, in order to meet the urgent needs of students in England, France and Belgium. The terms of the contract, however, have not been reported. They will be added in time.

e. Loan made by the students circle in Japan during the late Dynasty with the "Tung Ch'ing" Association, Japan . . . . Yen 60,000.—

The statement of the Ministry of Education is to the effect that the above item is for money collected by a Japanese industrial Society and loaned to needy students during the troubles. No report was made regarding terms.

List of foreign debts under Control of the Ministry of Education.

£ 75,000:0:0	. . = . .	Approx.	$ 750,000.—
Fcs. 536,100.—	. . = . .	„	$ 244,555.20
Yen 60,000.—	. . = . .	„	$ 60,000.—
Total		„	$ 1,054,555.20

F. Under Control of the Ministry of Industry and Commerce.

a. Money due by the Manchu Board of Agriculture, Industry and Commerce to the "Yi Ta" Firm, Tientsin . . . . Heng Hua Tls. 1,924.72

The statement of the former Board of Agriculture, Industry and Commerce is to the effect that this sum represents purchases of equipment made from time to time by the Industrial School. Date of payment, interest, etc., is uncertain. These will be ascertained in time.

List of foreign debts under Control of the Ministry of Industry and Commerce.

Hang Hua Tls. 1,924.72 = . .	Approx.	$ 2,887.08
Total	„	$ 2,887.08

G. Under Control of the Ministry of Home Affairs.

a. Money due by the Ministry of Home Affairs, Peking, to the Yokohama Specie Bank, Limited, ... $ 80,000.—
Interest $ 2,880.—

A dispatch from the said Ministry dated May 13th, 1913 states that the Contract for the above was made on May 1st 1913, Interest 6% a month, but gives no details regarding the period. We have here temporarily reckoned interest for half a year as above.

List of foreign debts under the Control of the Ministry of Home Affairs . . . . $ 82,880.—
Total . . . . $ 82,880.—

List of Totals of Domestic Short Term Debts due by the Central Government.

Ministry of Finance	$ 41,503,560.926
„ „ War	„ 3,690,174.177
„ „ Navy	„ 1,943,483.404
„ „ Education	„ 78,231.810
„ „ Industry and Commerce . .	„ 211,730.704
Home Affairs	„ 47,964.788
Domestic Total	$ 47,475,145.809

List of totals of foreign Short Term Debts due by the Central Government.

Ministry of Finance	$ 4,601,039.490
„ „ Foreign Affairs	„ 2,865,031.806
„ „ War	„ 10,305,817.833
„ „ Navy	„ 9,977,941.147
„ „ Education	„ 1,054,555.200
„ „ Industry	„ 2,887.080
„ „ Home Affairs	„ 82,880.000
Foreign Total	$ 28,890,152.556
Grand Combined total	$ 76,365,298.365

A NEW N. Y. K. STEAMER

On October 16th at the invitation of the Manager of the Nippon Yusen Kaisha a number of guests paid a visit of inspection to the latest addition to the fleet of that Company—the *Katori Maru*. The *Katori Maru* was visiting Shanghai en route to European ports on her maiden trip.

The vessel reflects the greatest credit upon the Kawasaki Dockyard, by whom she was built. It may be mentioned that she is the largest passenger vessel sailing under the Japanese flag. She is triple screw and the propelling machinery is of the latest type of turbine and reciprocating engines.

The new vessel is 510 feet long, 61 feet beam, and depth 36 feet 6 inches, has a gross tonnage of 10,500, with a displacement of 19,200 tons. Her speed is 17 knots, and she is classed 100 A 1 at Lloyds, the highest rating a vessel can have. She has accommodation for 112 first class, 56 second class and 186 steerage passengers. Nothing has been omitted to ensure the safety, comfort and convenience of passengers of all classes; there being a well equipped laundry and a barber shop, while the hospital and dispensary are in charge of a qualified surgeon. There is also a fully equipped dark room for the use of amateur photographers. In case of an outbreak of fire a complete installation of Clayton's fire extinguishing apparatus has been provided. The ship has been divided into numerous watertight compartments, making her practically unsinkable. Welin's patent davits for the handling of the lifeboats are a further guarantee of safety, and numerous contrivances have been installed to prevent the ship from rolling, and the British Board of Trade rules have been complied with. A refrigerating plant supplies the ship with plenty of ice, and Clayton's disinfecting apparatus and a perfect system of ventilation keep the ship free of odours. The vessel is electrically lighted throughout, and in addition to the regular ceiling lamps, reading lamps have been fitted to the first class berths. All the cabins are tastefully furnished and carpeted, chests of drawers, mirror front wardrobes, settees, etc., being in each. Fourteen cabins have two berths, one at each end, thus doing away with the inconvenience of upper and lower berths. On the promenade is a handsome suite de luxe consisting of sitting, bed and bath room with lavatory attached, and the furnishings are of very artistic design; the wood sculpture being remarkably fine. During the day the beds are folded up out of sight, and the bed and sitting rooms can be thrown into one apartment. The saloon is a spacious apartment and is lit by a handsome ornamental dome of stained glass and stained glass windows. The ceiling and panel decorations are real works of art. The social hall is on the promenade deck and is lavishly decorated in both European and Japanese style, the panelling being of polished satin wood with inlaid fancy work, while the settees, sofas, and easy chairs are upholstered in elaborate brocaded silk. The ceilling is of carved wood and the windows of stained glass with brocaded silk curtains. Here there has been installed a grand piano and a gramophone with a large selection of the latest records which will be changed every voyage. This apartment also contains a well stocked library and everything necessary for writing purposes. The smoking room is on the same deck and is also elaborately decorated with a large open fireplace. A portable piano can be used in the smoking room for smoking concerts or concerts on the promenade deck. Games of all sorts have been provided, including cricket nets, etc., while on the upper deck there is a large swimming tank, and for the children there is a splendid nursery equipped with all sorts of games. The second class accommodation is equally as good as the first class. Though not quite so elaborate, it has all the latest comforts and conveniences.

Messrs. Scott, Harding & Company send us a copy of the 4th (1913) edition of "Notes on Electric Lifts" issued by the firm of Messrs. Smith, Major and Stevens, Ltd., for whom they are agents. This excellent pamphlet is profusely illustrated and contains a vast amount of information about lifts of all kinds constructed by this well known firm.

THE FAR EASTERN REVIEW

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THE MONTH

Politics and finance in China as usual occupied most attention during November. These subjects are dealt with exhaustively elsewhere, and it is hardly necessary to supplement that article beyond recording that on November 26 a manifesto was issued convoking the Administrative Conference. This manifesto did not define very clearly the functions of the Conference; the most precise statement made by the President being:—"The delegates shall contribute their knowledge and assist in the administration so that the country may be placed on a solid rock-like foundation, firm and immoveable, and the expectation of the people to see an age of prosperity may be realised. I have great hopes therein."

With the President's hopes all will sympathise, but it must be admitted that prosperity still coyly hides behind the curtain of the future. Business both internal and external has been in an absolutely parlous condition, and pessimism is becoming the prevalent note in both foreign and Chinese business circles. Some doubt is beginning to be expressed in certain quarters as to whether less severity on the part of the Government would not be opportune at the present. It is suggested that the stagnation of trade is largely due to the fear that the punitive methods being employed to preserve the peace may in the event prove to be the cause of its breach.

Turning from politics it is to be noted that there has been a crop of rumours in regard to provincial and other loans. In connection with the rebuilding of Hankow four different syndicates have been credited with securing the right to provide the money. The negotiations with the Quintuple Group for another large Central Loan have been proceeding, but no definite result has as yet been achieved. The revenue from the Salt Gabelle, however, has been coming in splendidly, and Mr. Chang-hu, who is associated with Sir Richard Dane in its administration, speaks very hopefully in regard to the future.

The most important happening in regard to foreign affairs was the conclusion of the Russo-Chinese Agreement regarding Mongolia, which was signed on November 5. Desultory fighting with the Mongolians continued throughout the month, and owing to the Chinese being defeated within easy distance of Kalgan, that centre has been placed under martial law. No definite news has been received of the progress of the negotiations in India between representatives of China, Great Britain and Tibet, but from the fact that the negotiations have been so lengthy it is clear that considerable difficulty has been experienced in finding a solution of the knotty problem of Tibet's future status.

Railway matters has supplied no sensational development. The Sinyang-Pukow Railway Loan Agreement was duly signed, and it is understood that no time will be lost in beginning the construction work. Important conferences in regard to railway matters have been held in Peking, in which both foreign and Chinese technical representatives took part. Much good is expected to ensue from these interchanges of views. Other matters in connection with railways are referred to elsewhere.

CHINA'S RAILWAY ACCOUNTS

The inauguration of a conference to devise a uniform system of accounts for China's railways is a forward movement which raises a distinct hope that soon there will be a general effort made to introduce all round standardization, as has been urged by this journal for many years. A unification of accounts and statistics is more than the thin end of the wedge, if it can be carried into effect, but the peculiar nature of the methods by which China's railways have been constructed make it difficult of accomplishment unless the various banks interested in the financing of the lines and the high administrative authorities connected with the Board of Posts and Communications are heartily in accord with the members of the Conference who have the subject in hand. For the great good of the country it is sincerely to be hoped that both these important factors will see eye to eye with those who are striving to find a way out of the mystifying maze into which railway accounting in China has drifted. What the Conference is hopeful of doing now is to prepare a carefully devised but simple classification so that reports made by the various roads to the Government may be uniform and useful, implying, of course, uniform procedure in the use of the reports by the various offices quite as much as uniform accounting by the various auditors. Mr. Yih Kung-chao, the Vice-Minister and Director General of Railways, is the Chairman of the Conference, and this augurs well for the adoption of the reports which it is likely eventually to make under the active leadership of Dr. Henry C. Adams, of the American Interstate Commerce Commission, and Dr. C. C. Wang, the Vice-Chairman of the Conference, the man to whose energy its creation is due. The first meetings of the conference, referred to elsewhere in this issue, passed off harmoniously and successfully. Dr. Adams showed great discretion in addition to his special knowledge and experience, and rendered considerable assistance to the Conference, while the accountants from the various railways exhibited an enthusiasm for results of a workable character which is gratifying to all who look for loyal and co-operative action among those who have put their hands to the plough in China. The efforts of the members of the Conference, especially the advisory-members, to bring about this unification deserve every attention.

and no doubt the high authorities in the Government will see to it that the report which will ultimately be prepared will speedily be accorded the favorable consideration which it will deserve.

A RAILWAY CLEARING HOUSE

We invite the attention of the Commission for the Unification of Railway Acounts to the urgent necessity for considering the establishment of a Railway Clearing House for China. In the United Kingdom for instance a Railway Clearing House has carried on operations for three decades with signal success, and the inauguration of the system in China before the volume of railway business assumes larger proportions would be a wise and prescient measure. It may be as well to explain briefly the functions of the Clearing House in the United Kingdom. In that country passengers and goods have in very many cases to travel over lines belonging to different companies. It is necessary, therefore, to determine what proportion of a fare or freight charge should be credited to each company. Obviously for each company to make the necessary inquiries and researches would mean the provision of a special staff. If the fare or freight charge affected five different lines, the work would be performed by five different staffs. This waste of time, labour and money is prevented by the work being undertaken by the Clearing House, an independent concern, the findings of which can be accepted by all the companies interested as impartial. To explain the method by which the work is done would occupy too much of our space, but it may be mentioned that the Clearing House not only ascertains the amount due to each company for fares and freight charges, but also keeps track of the rolling stock which runs over more than one system and adjusts the charges for demurrage and so forth. The necessity for a Clearing House in China is already felt. Let us suppose, for the sake of example, that a package is consigned from Shanghai to Peking. It has to pass over the Shanghai-Nanking line; the southern section of the Tientsin-Pukow line; the northern section of the same line, and finally over the Peking-Mukden line. The authorities of each of these lines have to work out the amount due for their proportion of the haulage, and if there is any dispute a final adjustment may not be made until much time has been lost in correspondence. A vast amount of unnecessary work would in any event have been performed. No one authority is likely to accept the finding of an interested party without verification, but a Railway Clearing House on the other hand is entirely disinterested and its decision can be accepted without demur or examination. In regard to the supposititious package from Shanghai to Peking, if there were a Railway Clearing House in operation in China there would be no need for the four authorities concerned to do anything further than see that the package was carried safely and promptly to its destination.

There is no need further to emphasize the advantages that would attend the establishment of a Railway Clearing House in China. Every year the volume of business passing over connected systems will increase and, unless provision is made in good time, the authorities of each line will have to maintain a large and over-growing staff to do work that would be better and more economically performed by an impartial body. We commend this matter to the serious and immediate attention of the Government and the Commission, and suggest that the immediate inauguration of the system under some official who has special knowledge of the subject would be most conducive to the interests of the Railways of China—perhaps her best asset.

RUSSIA AND THE FAR EAST

Some little time ago when there was great uncertainty in regard to the upshot of affairs in the Balkans, it was thought that Russia would have very little time to devote attention to Far Fastern matters. However, she certainly found time to pursue her policy in reference to Mongolia to the logical conclusion. Also she has steadily pushed on with the construction of the Amur Railway, and it has been announced definitely that the opening of through traffic on the central section of the Railway has been fixed for the autumn of 1914. The entire Eastern section, it is anticipated, will be finished some time in 1915.

A double track is being laid from Vladivostok to Nikolaeivsk (the Ussuri Railway). A sum of Roubles 85,000,000 has been appropriated with this work, and a contract for driving the first tunnel at Kaparisov has been let for Rs. 3,800,000. A second contract for a large tunnel at Nadgenska, which is estimated to cost Rs. 5,500,000, was to have been let during November and other contracts are to be signed in the near future. Besides double tracking the line the alignment is to be straightened. The expensive tunnels referred to will greatly shorten the distance and in every way improve the line.

At Vladivostok, important port improvements are under way. This work is being undertaken by the Government. Wharves are being built and godowns (for both cold and warm storage), grain elevators and general wharfage facilities are being provided. This marks the first genuine effort of the Government to make Vladivistok anything but a purely military fortress. A great enlargement of trade is expected to result from the recent settlement of the Ussuri and Amur provinces and the completion of the Amur Railway.

A further indication that Russia is certainly not slackening off in her activities East of Baikal is the announcement that a new railway is to be built from Khabarovska on the Amur to the Imperial Harbor on the Japan Sea. The Imperial Harbor is the best harbor north of Vladivostok, and like Vladivostok is accessible throughout the year for any vessels. In the past some logs have been exported from this harbor to Australia, and it has been of great importance to the development of the fish industry in these seas. This line will open up an entirely new country, well timbered and containing some minerals. The tunnel through the main dividing range will be of considerable length. Construction will be begun next spring, and the necessary financial appropriation has already been made by the Government. Imperial Harbor is the natural terminus of the Amur Railway. The Committee of the Duma has passed the bill relating to the construction of railway from Werchne Udinsk to Kiakhta.

The foregoing seems to show that Russia is not so preoccupied by European affairs that she cannot make timely provision for future development in the Far East.

MINING IN CHINA

The Minister of Industry and Commerce is devoting considerable attention to mining matters, and a statement was issued towards the end of the month by the Ministry calling attention to the country's great mineral wealth. Reference is made to the fact that throughout China there are no more than five mining enterprises with a capital of $10,000,000 and five with $1,000,000.

The statement then continues: Firstly, although good mining laws are necessary, good men to enforce them are also required. The statement instances Japan and suggests the establishment of special departments in all provinces on lines similar to the Japanese system.

Secondly it refers to the aversion of Chinese capitalists to invest money in mining enterprises and assumes that foreign capital is necessary, but states that restrictions should be placed on such capital.

It is also considered that foreign interests should not exceed forty per cent. Thirdly, the statement points out that Chinese owning land containing minerals have always shown a disposition to prevent its being opened up or to demand an excessive share of the profits.

It therefore hints that the Government must be the acknowledged owner of all mining properties similarly to foreign countries and that the Government will draft regulations by which the owner of the land and the prospector will each secure a fair share of the profits after paying the Government a moderate royalty.

It is reported that Mr. Yang Tsu-chi has been appointed President of the Chinese Board of Directors of the Sino-Japanese Syndicate.

CHINA, RUSSIA AND MONGOLIA

TEXT OF THE AGREEMENT

The Mongolian Agreement between China and Russia was signed on November 5 by Mr. Sun Pao-ki and M. Kroupensky. Following is the text of the Agreement:—

I.

Russia acknowledges that Outer Mongolia is under the suzerainty of China.

II.

China recognizes the autonomy of Outer Mongolia.

III.

Recognizing the exclusive right of the Mongols of Outer Mongolia to provide for the internal administration of autonomous Mongolia and to settle all questions of a commercial and industrial nature touching their country, China engages not to intervene in these affairs, and consequently will not send troops into Outer Mongolia, nor establish any civil or military official therein; and will abstain from colonizing the country. It is, however, agreed that a dignitary sent by the Chinese Government may reside in Ourga accompanied by a necessary staff and an escort. Moreover, the Chinese Government may, in case of need, station, in certain localities in Outer Mongolia to be defined during the negotiations provided for in article V of the present agreement, agents for the protection of the interests of its citizens. Russia, on her side, engages not to maintain troops in Outer Mongolia, except consular guards; nor to intervene in any phase of the administration of the country; and engages to abstain from colonizing it.

IV.

China declares herself disposed to accept the good offices of Russia for the purpose of establishing her relations with Outer Mongolia in conformity with the principles hereinabove announced and with the stipulations of the Russo-Mongolian commercial protocol of October 21, 1912.

V.

The questions which relate to the interests of China and Russia in Outer Mongolia and which have arisen from the new state of things in that country shall constitute a subject of subsequent negotiations

In witness whereof the undersigned, duly authorized for the purpose, have signed the present Declaration and have thereunto affixed their seals.

Done in Peking in duplicate the fifth day of the eleventh month of the second year of the Chinese Republic, corresponding to October 23 or November 5 one thousand nine hundred thirteen.

(Signed) SUN PAO-KI.
B. KROUPENSKY.

On proceeding to sign the Declaration bearing the date of to-day relative to Outer Mongolia, the undersigned Minister of Foreign Affairs of the Chinese Republic, duly authorized to this effect, has the honor to declare, in the name of his Government, to His Excellency Monsieur Kroupensky, Envoy Extraordinary and Minister Plenipotentiary of His Majesty the Emperor of all Russia, as follows:

1—Russia recognizes the territory of Outer Mongolia as forming part of the territory of China.

2.—Concerning questions of a political and territorial nature, the Chinese Government will put itself in agreement with the Russian Government by negotiation in which the authorities of Outer Mongolia will take part.

3.—The negotiations provided for in article V of the Declaration will take place among the three interested parties, who will designate for this purpose a place for the meeting of the delegates.

4.—Autonomous Outer Mongolia will comprize the regions which have been under the jurisdiction of the Chinese Amban of Ourga, of the Tartar General of Uliasoutai and of the Chinese Amban of Kobdo. Seeing that there are no detailed maps of Mongolia and that the boundaries of administrations of the country are indefinite, it is agreed that the exact boundaries of Outer Mongolia as well as the delimitation of the line between the district of Kobdo and the district of Altai will constitute a subject of subsequent negotiations provided for in Article V of the Declaration.

The undersigned seizes this occasion to renew to His Excellency Monsieur Kroupensky the assurances of his very high consideration.

(Signed) SUN PAO-KI.

A statement in similar terms was made by M. Kroupensky.

Mr. Chang Chien, Minister of Industry and Commerce

COMMISSION TO UNIFY RAILWAY ACCOUNTS.

The Commission on the Unification of Railway Accounts began its first session at 10 a.m., on the 19th November in the Ministry of Communications, Peking. The conference lasted four days. The members present were:—

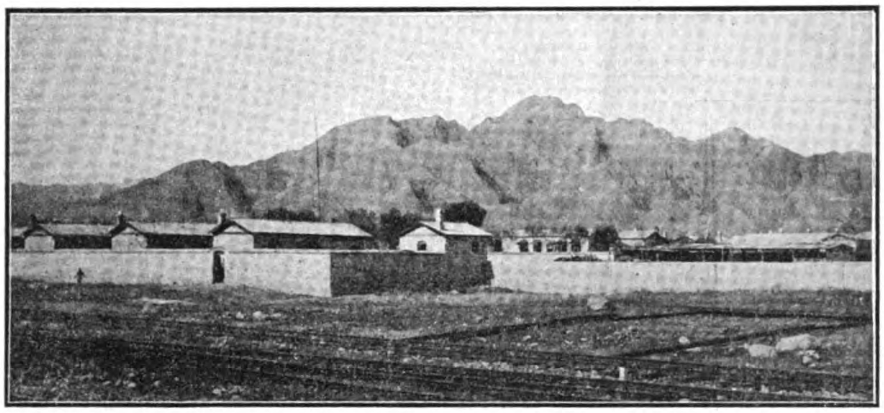
Chairman: Mr. Yih Kung-chao, Vice-Minister of Communications and Director-General of Railways; *Vice-Chairman:* Dr. C. C. Wang; *Adviser:* Dr. Henry C. Adams; *Advisory Members:* Messrs. W. Henderson, C.A., H. Middleton, H. Brickner, B. Bellion, F. Y. Chen, T. Cheu, Y. T. Tseng and H. C. Lee; *Members:* Messrs. K. S. Tsang, J. T. Zhen, C. P. Yin, C. S. Liu, S. F. Yih, Souen-Souen; *Assistant Members:* Messrs. C. K. Tsao, H. Y. Chen, L. Ho. T. C. Ma, Y. C. Ying, C. M. Chow, T. Y. Chao and S. Tchang.

The conference was opened by an address from the Chairman, Mr. Yih Kung-chao, who welcomed the members to the Ministry and wished them every success in their labours. He described the Commission as being like a ship bound for a destination which could be reached by a number of routes, and that it did not matter which particular route was taken as long as the desired point was reached. The object of the Commission was to get to a point to secure unified forms of procedure in accounting, and it did not matter which method was taken as long as the point was gained. He understood that the meeting represented the different systems of Railway Accounting, and by combined effort a definite classification should result. A unified system was wanting and the Commission must form such a system. He regretted very much having the duties of the Vice-Minister of Communications to perform, as they prevented him being present at all the meetings. In his absence he wished to depute Vice-Chairman, Dr. Wang, to act on his behalf. He then left the conference in charge of the Vice-Chairman, Dr. Wang, who conducted the meetings throughout.

The conference progressed very rapidly. The Bye-Laws regulating the Commission were drafted and accepted at the first session.

Owing to the fact that new lines may be constructed in the near future, the Commission decided to take up the Construction Accounts previous to doing

(*Continued on page 230*)



PEKING-KALGAN RAILWAY.—The new quarters at Nankao for employees.

PEKING-KALGAN RAILWAY

The reports of the working of the Peking-Kalgan railway for the second half of 1912 shows a gain in earnings of Mexican $221,-424.46 over the returns for the similar period of the previous year. The figures are as follow:—

	1912	1911
July	$150,509.17	$104,213.37
August	164,771.34	136,966.77
September	154,724.56	167,488.84
October	192,764.73	118,946.23
November	198,131.40	184,312.67
December	224,708.92	152,257.80
	$1,085,610.15	$864,185.68

The increase shown in this table is $221,424.46, but there is still a surplus derived from half-fares which does not appear in the above comparison, and which is as follows:—

	1912	1911
	$45,662.70	$142,809.70
Gross total	$1,131,272.49	$1,006,995.38

The above amounts were made up as follows:—

Passenger fares	$261,739.40
Freight	770,409.57
Half-pay fares	45,662.79
Miscellaneous receipts	53,461.18

The traffic returns show that 254,279 passengers were carried during the six months, and 229,393 tons of freight, in addition to 83,591 tons of official material—a total of 312,984 tons.

The train miles run were 209,637.

The report lays particular emphasis upon the difficulties caused by an insufficiency of goods cars, stating that "in the first term of 1912 the management submitted a statement to the Board of Communications showing what freight was being carried and what cars were necessary to cope with the increasing business. Owing to the scarcity of cars raw products showed no increase in the months of July, August and September, although there was an increased demand for transportation facilities. Losses were being sustained owing to the lack of cars to meet the demands for local and foreign transportation. An attempt was made to borrow cars from the Peking-Hankow and Peking-Mukden Railways but the request could not be complied with owing to a shortage of cars on both those lines. Cars were ordered from the Tongshan works but though the time of delivery had expired no cars had been delivered. If the Tongshan works could make the delivery the freight would show a great increase."

In the report on railway maintenance it was shown that much building work had been gone on with. An eight-roomed brick house was built for the Traffic Dept.; brick quarters containing 50 rooms were built were the Loco. Dept.; a four-roomed stone house was built for the Engineering Dept. At Nankao a brick loco. shed, 250 feet in length, houses for the Loco. Dept., quarters containing 56 rooms for the staff, as well as store-houses, and police station containing sixteen rooms, in addition to a car shed 135 feet long were erected. A loco. shed 96 feet long was also built at Kang-chuang, whilst another one was erected at Kalgan 200 feet in length. The platforms at Hsin huayuan, Shahe, Ching-lo and Shelingtzu were prolonged 100 feet each. Much work was continued on the retaining walls at various points on the line.

The Changsui Extension.—The extension of the line from Kalgan to Suiyuan—or that part of it opened to traffic—was taken over by the Board of Posts and Communications in April, 1912, the returns for the last half of the year being as follow:—

July	$26,772.45
August	28,687.47
September	17,343.97
October	20,017.22
November	30,791.94
December	51,146.61
Total	$174,759.66

The earnings were divided as follow:—

Passenger fares	$ 46,804.90
Freight	123,940.67
Miscellaneous receipts	4,005.09
Total	$174,759.66

The first, second and third class passengers numbered 42,314. Freight totalled 35,168 tons, in addition to 2,347 tons of official material.

THE PROPOSED SINYANG-PUKOW RAILWAY

On October 27 the Senate at Peking gave its approval to the signature of the agreement for the proposed railway to connect the Tientsin-Pukow and the Peking-Hankow railways, and on November 14, the agreement was signed between the Chinese Government and the Chinese Central Railways Limited, of London, the concessionaires.

The proposed railway is one of the four concessions granted in 1898 and 1899 by the Chinese Government to the British after the Peking-Hankow concession had been given to the French and the Belgians. The other three were the Shanghai-Nanking, the Canton-Kowloon, and the Shanghai-Ningpo railways.

The preliminary agreement for the Pukow-Sinyang railway was made in January, 1898, on the understanding that the signing of the final agreement should await the completion of the final agreement for the Shanghai-Nanking railway and be drawn up in similar terms. The Boxer trouble, the South African war, and the Russo-Japanese war contributed to long delay, and it was not till 1903-4 that the Shanghai-Nanking railway agreement was settled. By this time it was decided that the Pukow-Sinyang railway agreement could not be taken into consideration until the Tientsin-Pukow railway agreement had been dealt with, and four years expired before that was accomplished. That agreement was completed in 1908, but the Chinese Government then decided that the construction of the Tientsin-Pukow line was desirable before concluding matters for the building of the cross country railway. A further four years passed, and it was not till 1912 that the Government resumed negotiations for the completion of the agreement connected with the outstanding concession.

Mr. Shun Yen-pei was, in 1912, appointed commissioner to negotiate, and Mr. T. J. Bourne, who has had long experience in China, was in 1913, designated as the Engineer-in-Chief of the proposed line and was commissioned to make a survey to determine the location of the line.

Mr. Bourne selected a route running between Wu-I, about twenty miles north of Pukow, and Sinyang, the country to be traversed being under heavy cultivation, but without any other communication or means of transport than cart roads. The movement of crops and local produce is entirely dependent upon cart transport, a slow and unsatisfactory method. The railway will cross the wealthy Ho-fei district, where the great landed estates of the Li Hung-chang family are situated, and in addition to prospects of heavy grain traffic it is hoped that the coal deposits, known to

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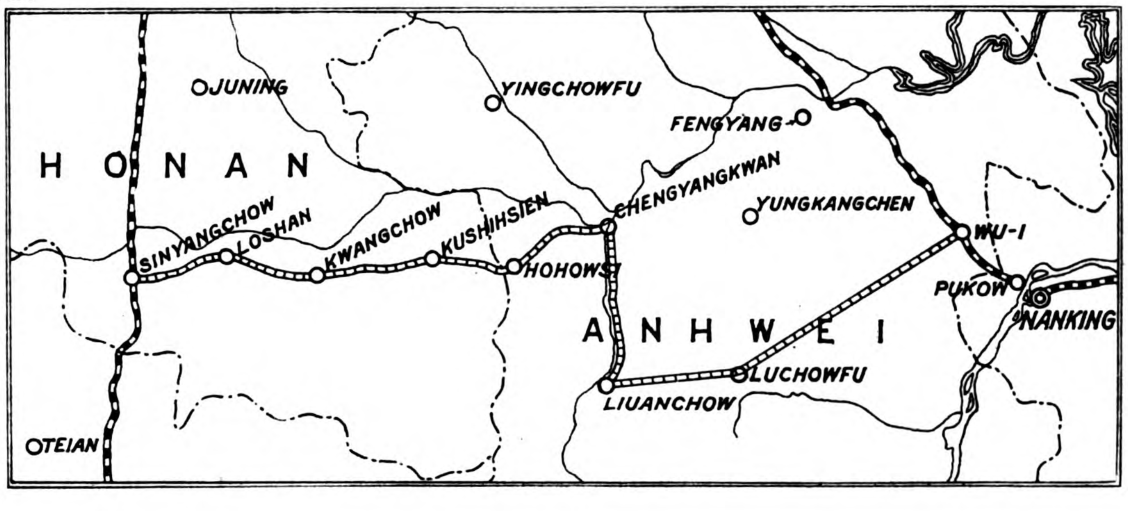


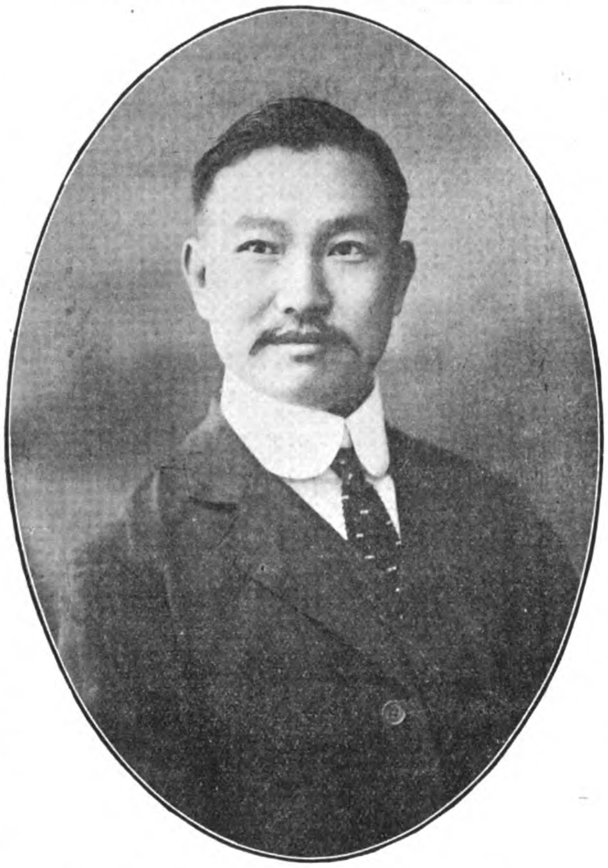
TIENTSIN-PUKOW RAILWAY (SOUTHERN SECTION)

THE LINE AND THE REBELLION

Very little has been heard of the actual situation that existed in regard to the Southern Section of the Tientsin-Pukow Railway during the exciting days of the rebellion in July. It was known that the engineers and staff generally had had a most trying and anxious time, but the public generally had no idea of the dangers and difficulties that were undergone in endeavouring to preserve the property of the railway. Railwaymen are notoriously averse to publicity, and they shrink from emphasising the importance of their personal efforts in times of stress. As a result it is difficult to get them to speak of the part they played in affairs such as the recent rising, and when information is obtainable it is usually in the form of a tersely-expressed official report. In this little reference is made to the devotion to duty, courage and ready resource shown, but to those who can read between the lines these are clearly apparent. We have seen copies of reports supplied to Mr. Chao Ching-hua, then the Associate Director of the Southern Section of the Tientsin-Pukow Railway, by Mr. A. R. J. Hearne, Acting Engineer-in-Chief and by Mr. J. Alston, Local Superintendent, which show that really excellent work was done.

The then Associate Managing Director, Mr. Chao Ching-hua, rendered important services to the Government during the rebellion, and this has been recognised by his promotion to the post of Managing Director of the whole Tientsin-Pukow line, and the bestowal of the 4th grade of the Wenfu decoration. At the beginning of the outbreak at Nanking he was called upon by the Ministry of Communications to follow the Government army and to attend to the work in connection with the transportation of troops and munitions. With some of his staff he lived in railway cars travelling from station to station for nearly forty days. During the first half of this period he was busy with the engineers in connection with the work of repairing the Kuchen Bridge and other parts of the track that had been damaged. During the later half he remained mostly at Puchen looking after the rolling stock, most of which was at that time in the hands of military officers. In consideration of his work General Feng Kuo-chang appointed him Inspector-General of the 2nd Army. Mr. Chao returned to his office at Shiakwan on September 2, the day after the capture of Nanking. It may be remarked that the railway property at Shiakwan did not suffer in any way during the outbreak.

Mr. Chao Ching-hua is a native of Chekiang Province, and was educated in the Diocesan School, Hongkong. After pursuing advanced studies in the Chinese Government Telegraph College of the Two Kwang (Kwangtung and Kwangsi Provinces) in which he was graduated, he entered the service of the Telegraph Administration. In 1896, he proceeded to Tientsin, where he joined Mr. Bohr, the Chief Superintendent of Telegraphs at that port as the latter's secretary. He did not stay long in the service of the Telegraph Administration, as in the following year he entered the service of the Chinese Government Railways and was made secretary and translator to the Head Office of the Tientsin-Lu Kou Chiao (Peking) Line, and the Lu Kou Chao Paoting Fu Line (the first section of the Peking-Hankow Line built by British engineers). Ever since he has been closely connected with railways in China, holding different posts of responsibility in various railways.



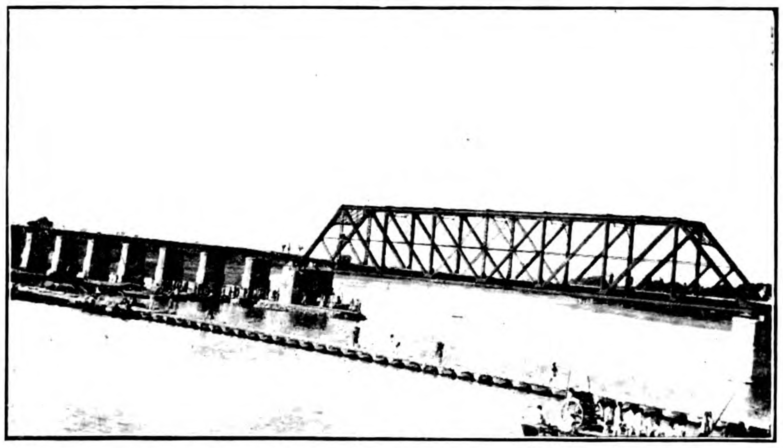
Mr. Chao Ching-hua, Managing Director of the Tientsin-Pukow Railway

After the Boxer trouble in 1900, he was again active in railway concerns, and during 1905 and 1906 he undertook very heavy constructional works on the Shanghai-Nanking Railway. To carry out the works contracted by him, he had to import 2,000 trained labourers from Tientsin and Honan Province, a feat which he successfully accomplished. The rail-laying from Shanghai to Nanziang was started by him and also earthwork on the workshop yard and buildings at Woosung.

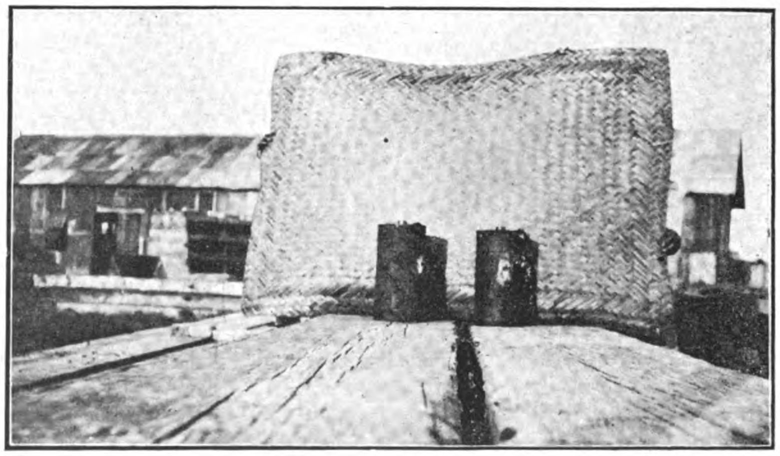
In 1907 when Mr. Tang Shao-yi was Director General of the Five Government Railways, Mr. Chao was entrusted with the dual posts of secretary and auditor to Mr. Tang, but he was subsequently transferred to the Board of Communications in Peking where he held various responsible posts, mostly in connection with railways and prior to his appointment as Managing Director of the Canton-Kowloon Railway, he was the first secretary in the Foreign Department and also in charge of the Audit Department of the Directorate General of Railways, to which posts he was promoted in 1909.

On the tour of inspection of the northern section of the Tientsin-Pukow Railway by the Deputy General and of the Canton-Kowloon Railway by the Director General, Mr. Chao was selected as secretary and accompanied the two officials through their inspection. Before he went to Canton, he was deputed to inspect and report on the Southern section of the Tientsin-Pukow Railway.

From the end of 1910 until November 1912 Mr. Chao was Managing Director of the Canton-Kowloon Railway. He was the special delegate from the Chinese Government in the negotiations with the Government of Hongkong for an agreement for working the Chinese and British sections of the railway, which duty he performed with marked ability. When he left to take up his post at Pukow he received several presentations from his foreign and Chinese colleagues.



View showing Kuchen Bridge after dynamite explosion on South Pier and work showing progress on temporary foundation.



View showing dynamite in drums used by the Rebels for blowing up bridges on Tientsin-Pukow Railway, Southern Section. Those in photograph taken off Pengpu Bridge after Rebels had been persuaded not to blow up Bridge. The Engineer-in-charge took up two *li* of track on North side of Bridge to compensate.

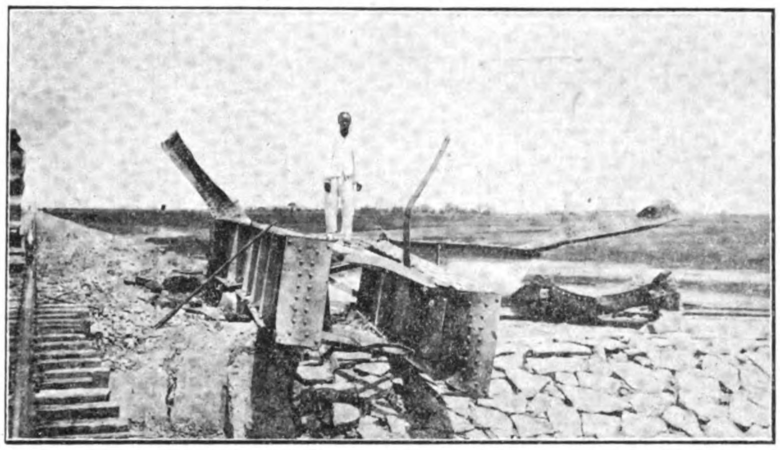
View showing temporary repairs to Bridges at mile 136.
One 30 ft. span destroyed.
One 20 ft span destroyed.
One pier destroyed.
One abutment badly damaged.

Acting Engineer-in-Chief's Report

Mr. A. R. J. Hearne reported :—

The Rebellion broke out on the 15th July, 1913, the first intimation given being the occupation of Pukow, and Hsu Chow Fu by Rebel troops and a Military proclamation to say that the Tientsin-Pukow Railway Southern Section was under martial law, and all Railway employees were ordered to remain at their posts.

I called at the Head Office on the 16th July to get what money there was in order to pay off as many men as possible and to arrange for sufficient funds to keep the line going on a purely maintenance basis.



View showing effect of dynamite explosion to 30 feet span bridge at mile 136.

Not knowing how long the trouble would last, I determined to stop all construction work, so issued instructions to all engineers to cut down their staff to the minimum, leaving only sufficient for the safety of the track. These orders were carried out immediately.

In the meantime troops were pouring into Pukow from Nanking and entraining for Pengpu, Hsu Chow Fu and Li Kwo Yi.

On the 17th July the outposts of the Rebel Army came into touch with the Government Forces near Hanchuang, and from that date till July 20th, engagement after engagement was fought mostly on the Railway or its immediate vicinity, the Government troops eventually driving the Rebels back into Hsu Chow Fu.

As the rebels retreated from Hanchuang to Hsu Chow Fu they destroyed the following bridges :—

1—20 feet span at mile 232.3/4
1—20 „ „ „ „ 226.1/4
1—20 „ „ „ „ 220
1—30 „ „ „ „ 219

The piers and abutments in connection with the above were badly damaged, dynamite being used in large quantities.

Also station buildings at Li Kwo Yi, Liuchuan, and Maotsun and all platelayers' houses seriously damaged, all wood work being destroyed, electric staff and telegraph instruments damaged or carried away bodily.

On July 22nd, rebels received orders from General Pah Wen Yu to evacuate Hsu Chow Fu, and during the whole day about 12 trains left en route to Nan Hsu Chow, Kuchen and Pengpu, and on the morning of 23rd July, Hsu Chow Fu station was dismantled, and the last of the rolling stock taken southwards.

I saw Mr. Ridgway personally on the night of 21st and gave him instructions to remain at Hsu Chow Fu until the Government troops occupied the place, when he was to start temporary repairs to damaged bridges and track as far as possible with the men and materials at his disposal.

Mr. Ridgway was seriously hampered by want of transport facilities, and only managed to get the Maotsun Bridge repaired temporarily when the trains from the north arrived, the bridges north of Maotsun Station having been attended to by the northern section engineers, who preceded the Government troops with a construction train with materials and men.

Between the 22nd and 28th July the rebels evacuated the line down to Kuchen, blowing up the following bridges en route :—

1—30 feet span at mile 198.3/4
1—20 „ „ „ „ 185.1/2
1—30 „ „ „ „ 136
1—30 feet span and 1—200 feet at Kuchen mile 135.

All stations north of Kuchen were treated in the same way, that is to say dismantled and staff compelled to leave.

The Rebel Army had concentrated all their forces by this time at Pengpu, and also had the whole of the southern section Rolling Stock with them.

I had grave fears as to what the troops intended doing to the Huai River Bridge at Pengpu and sent for Mr. Connell to come up from Puchen to assist Mr. Aries. The bridge was patrolled by railway employees night and day with instructions to let the engineers know if any dynamite were being carried on to it, and I arranged with Mr. Aries that he was to do everything in his power to stop the rebels from blowing up the bridge. I could not stay at Pengpu myself as I had an urgent wire from the Associate Managing Director from the Board of Posts and Communications, Peking, on the 28th July to proceed north via Shanghai, Tsingtao, and Tsinanfu to take over the repairs to track from Mr. Dorpmuller.

I left at once for this purpose, and on the 29th July heard that an attempt had been made to blow up the Huai River Bridge, but owing to the strenuous objections raised by Mr. Aries, the officer commanding the rebels agreed not to do so, provided the engineers pulled up two li of track north of the bridge, which was done.

Arrived in Shanghai on 30th July to find it impossible to get a boat to Tsingtau till the 2nd August, and taking into consideration that the line would be terribly congested from Tientsin with troops, decided to abandon this scheme and attempt to get North via our own line, risking being stopped by rebels.

Left Shanghai on 2nd August by special train and motor trolley, arrived Nanking the same night, left Pukow on 3rd August by special, and owing to a mistake made by the Rebel Commander at Lin Huai Kwai (where the head quarters of the Army was stationed) my train was allowed to proceed. Arrived at Pengpu at 4 p.m. to find the station occupied by the advance guard of General Feng Kuo Chang's Army. Two engines were lying in yard seriously damaged ; in fact useless, owing to a collision, and 10 empty cars.

Repairs had almost been completed to the two li of track north of the Huai River Bridge, so after collecting the empties continued to Kuchen and arrived at 7. p.m.

The northern section engineers, under Mr. Dorpmuller, had just started filling in rubble for temporary foundations.

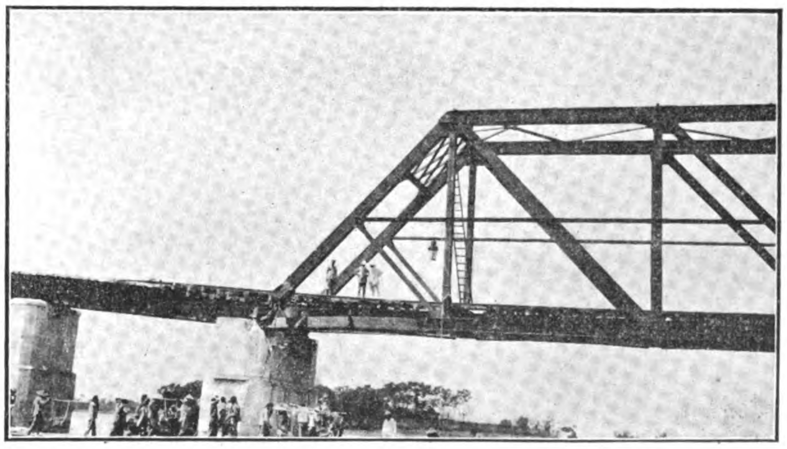
I took over the work on the following morning, 3rd August, and wired the Associate Managing Director, who was at Nan Hsu Chow supervising the transport, and he arrived at same afternoon. Mr. Aries and Connell also arrived from Pengpu to assist in repairing the bridge.

In an interview with General Feng Kuo Chang and the Associate Managing Director, I promised that the bridge would be opened for traffic in ten days, and this was carried out.

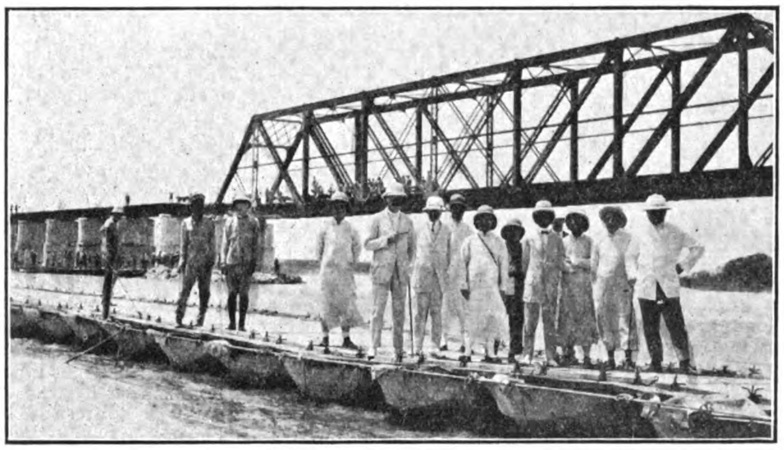
Technical details with regard to damage and repairs of Kuchen Bridge given separately at the end of report.

From 4th August very little happened on the line except that the rebels gradually retired, followed by Government troops until on 13th, the former retired into Nanking City and the lattter occupied the reminder of the railway up to Pukow Wharf.

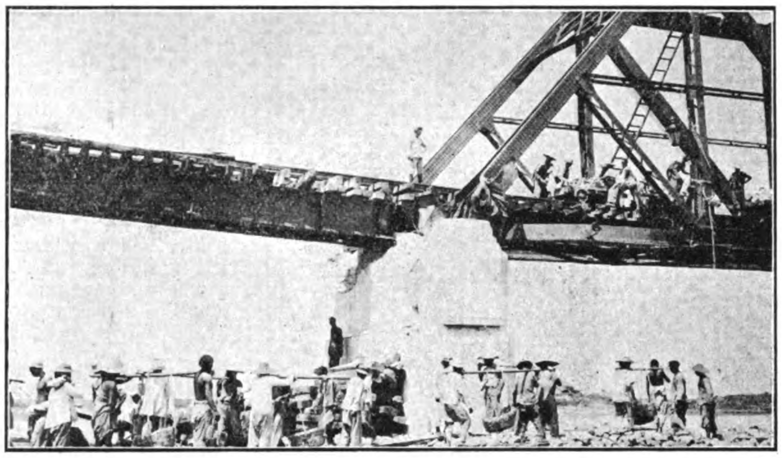
The bombardment of Nanking started on 14th August. General Feng Kuo Chang posted two batteries of artillery at the Pukow Wharf Tank house and three batteries on the hills at Puchen, one of which was immediately above and behind the Engineers' Quarters, and during the 19 days' bombardment the Engineering and Locomotive Department staff remained at their posts, although under shell fire during the whole period.



View showing damage done to Kuchen Bridge after dynamite explosion.



View showing group: Associate Managing Director, acting Engineer-in-Chief, Engineers and staff on Military pontoon bridge at Kuchen.



View showing damage done to 200 feet span, 30 feet span and Pier at Kuchen Bridge after dynamite explosion.

Nanking was captured on 1st September.

The steam launch service being maintained with the hulks and warships was of great value, as it ensured supplies of provisions and delivery of mails during the bombardment.

Considering the number of shells fired from Lion Hill and the Mud Forts in Hsia Kwan, at Pukow Wharf and Puchen very little damage was done to railway property comparatively; the hulk Ariel had several shots through the superstructure and one through the steel pontoon fortunately above water level, No. 2 godown riddled, water column wrecked, tank house damaged, and new running shed badly hit, 18 rails on main line were cut through and damaged.

The signal apparatus at every station on the line damaged and the majority of points at passing loops.

Fencing at stations where troops were stationed were more or less destroyed, the slats being utilised for firewood and picketing pegs.

All station buildings suffered from broken windows and the majority from wood work being destroyed.

A number of staff and telegraph instruments damaged.

I cannot say enough for the loyalty of the engineers and staff under me and the work they carried out under the most trying circumstance in order to keep the line in running order.

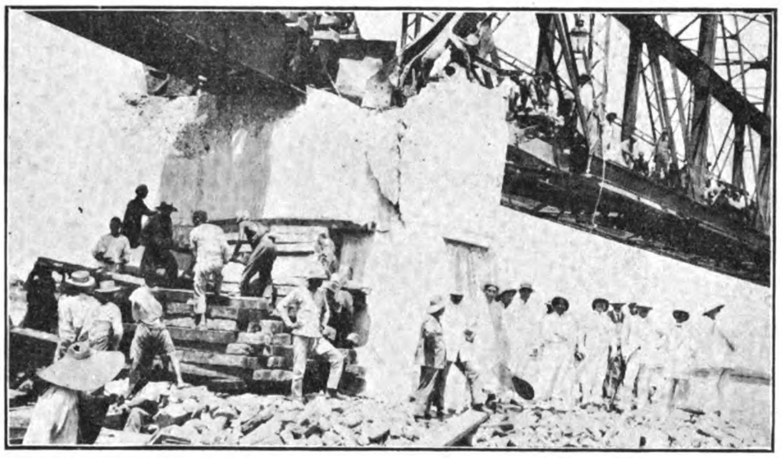
The Kuchen Bridge

In reference to the Kuchen Bridge at Mile 135, Mr. Hearne reported:—

This bridge is the largest and most important of those destroyed during the Rebellion (July 15 to September 1st, 1913) and the following is a short account of the temporary repairs.

Kuchen bridge carries the railway over the Hwei Ho, is 923 feet 3 inches long, and from South to North consists of seventeen 30-foot spans, one 200-foot span and four 30-foot spans on the North side.

The 200-foot span is of the through pratt type divided into eight bays, the smaller spans are bridged by deck plate girders.



View showing damage to Pier and East Girder of Kuchen Bridge also temporary foundations carried above water level.

Dynamite was placed by the rebels on the south pier of the 200-foot span and exploded by electricity, with the result that the top of the pier was badly damaged, chiefly on the east side, the fixed bearings of the 200-foot span blown into the river, and the west girder jumped off the roller bearings on the north pier

The west girder fell 2 feet, fortunately on to the only part of the pier that was left solid enough to take the weight, but it had to support the east girder by means of the cross girders, and overhead bracing.

The end bay of the east girder was completely destroyed, end cross girder badly damaged, and separated from main girders, the rivets all being sheared.

The 30-foot plate girders, also resting on this pier, were not seriously damaged, but had dropped two feet, being held up by broken parts of the pier.

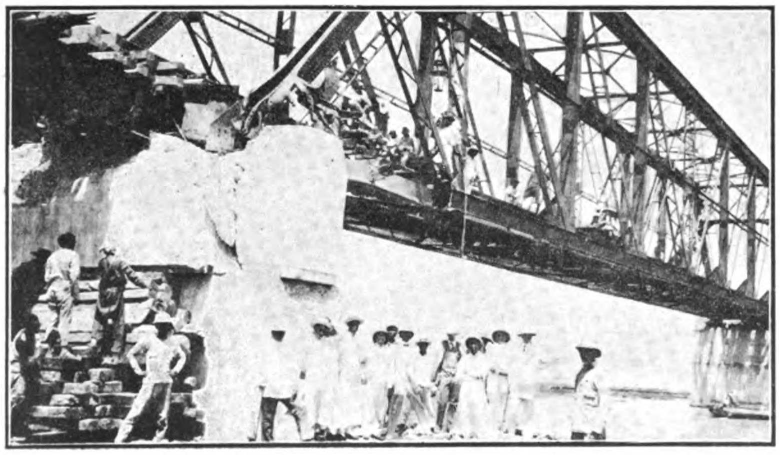
The pier is built of concrete, and as well as being shattered on top showed cracks running ten feet down from the top.

As soon as the place fell into the hands of the Government, work was started on temporary repairs to enable the bridge to be used for traffic.

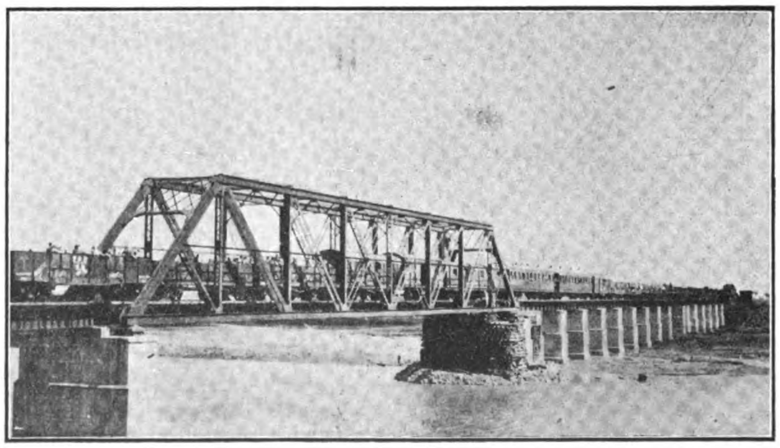
Owing to the rebels occupying the line south of Kuchen the work was started by the northern section engineers, who followed the Government troops down to repair any bridges that were destroyed, however immediately the British engineers of the southern section got up the line, which was a couple of days afterwards, the work was handed over to them.

The plan adopted, consisted in filling rubble round the damaged pier till it reached a height of three feet above water level: then to construct sleeper stacks on both sides of broken pier to carry 30-foot girder on the one side, and rail bearers, and west girder on the other, a third sleeper stack, and the most important being built under the eastern girder.

The third stack has its centre 25 feet from damaged pier, and forms the new pier for the broken girder, reducing its span to 175 feet.



View showing damage to Pier and East Girder of Kuchen Bridge, also temporary rubble foundations carried above water level.



View showing train crossing Kuchen Bridge at mile 135 after temporary repairs completed. Time taken to repair, 10 days.

Next to lift girders to their proper level by means of jacks, and to bring the main girders into line, it was found that their centre line was over six inches out.

Finally to strengthen the end vertical member which would now form the end strut of the eastern girder, and which was calculated to stand a stress of 130 tons.

Night work was immediately started, the engineers taking three hour shifts to superintend the work; some idea of the magnitude of the work may be had from the fact that one thousand men were employed.

The depth of the water alongside the damaged pier was approximately five feet while forty feet out it was twenty-one feet. The bottom was soft, and consequently the rubble continually sank as the mass of stone grew larger.

The rubble was collected from the embankments at the ends of the bridge where it had been used as pitching for their protection from floods, and carried to foundation site over a bridge of boats, also a temporary track laid across damaged part of bridge facilitated matters by allowing the use of push trollies loaded with stone to be carried, and deposited where required from the bridge itself.

As soon as the foundation had been brought up to the required height, the sleeper stack under the eastern girder was put in hand: first thirteen rails were laid at one foot centres and running parallel to the girders, carefully levelled, and ballasted with two inch broken stone. On top of the rails, sleepers were laid, each one being wedged tightly and dog spiked to the one above it.

The sleeper stacks for the western 200-foot girder, stringers, and 30-foot girders were then built, no rails being used in their case, the rubble being levelled with small stones, and the first row of sleepers placed on that foundation.

The next work was the lifting of the girders by jacks, two 50-ton, and one 30-ton hydraulic, in addition to several 15-ton screw jacks were tried; unfortunately all the hydraulic jacks failed, but six 20-ton transverse screw jacks were secured from the locomotive department which proved sufficient; the transverse arrangement combined with hauling on wire rope attached to girder brought the bridge back to the correct centre line.

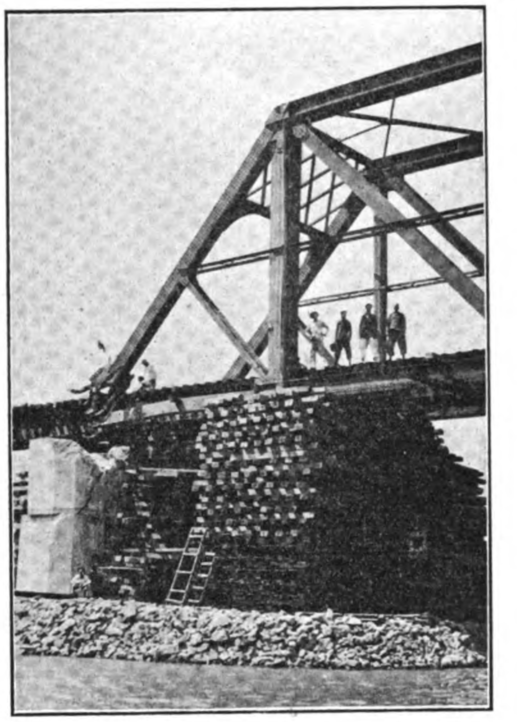
During the last operation the eastern girder jumped back on to its roller bearing at the north pier.

As expected the foundations sank when the weight of the girders was put on it, consequently it was decided to raise the end two inches higher than the correct level, to allow for any sinkage, either from the foundation or when trains ran over the bridge.

Once the required height was obtained the eastern main girder was wedged tightly, directly on to the sleeper stack, and in order to carry the ends of the western girder, stringers, and 30-foot girders, seventy-seven rails were used, built up in rows with heads and flangs alternately reversed, the rails resting on the sleeper stacks at each side of the damaged pier.

The last thing to be completed was the strengthening of the first vertical in the damaged east girder, which consisted of four bulb angles connected by bracing to form an I-stanchion. All these members were badly damaged by the explosion so that it was not possible to calculate its carrying power. Two 12-inch by 12 inch balks of timber were cut to fit in between the bulb angles, and outside these were placed two 10-inch by 5 inch rolled steel joists; the timber and joists being bolted together. As the top boom on one side was formed of two channels with a plate on top, it was necessary to introduce two rails bolted to a timber, and directly jutting against the bottom of the channel, the latter being packed with timber.

On the other side was the end diagonal compression member, and as timber and steel joists butted



View showing temporary rubble foundation sleeper stack. Reinforcement of 1st vertical, damaged Pier and steelwork.

against the under side of this there was no necessary for rails. Thus the stress in the temporary strut was transferred to the vertical members of the boom.

The testing of the bridge was carried out as follows :—

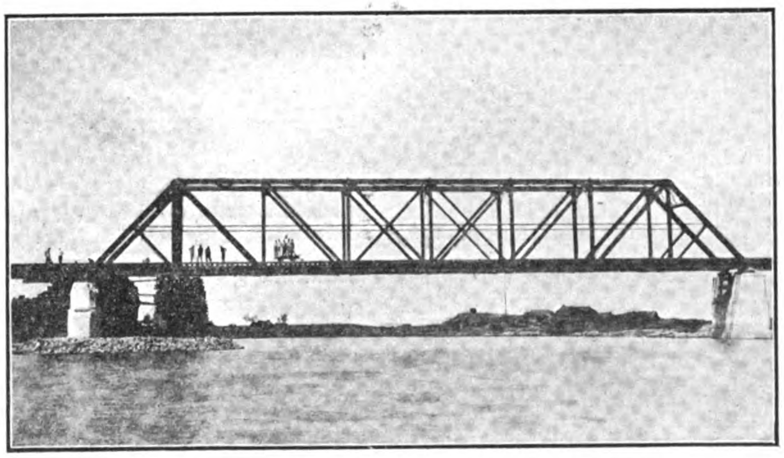
A light engine and two cars crossed, causing a sinkage at the end of Eastern girder of 0.06 of a foot, the second test consisted of a heavy engine weighing with tender about 30 tons, followed by 12 30-ton cars fully loaded with rubble which caused a depression of 0.05 of a foot which the train was on the bridge, but the sleeper stack recovered this amount when the train had crossed.

The bridge was opened for traffic on the 14th August, exactly ten days after the work was handed over to the British engineers.

General Feng Kuo Chang immediately rushed train after train of troops, guns, and stores over the bridge en route for Pukow and the attack on Nanking.

Although instructions were given that two engines were not to cross the bridge coupled, these orders have been infringed on two occasions, and very heavy traffic has been running day and night for one month, but the total sinkage is only two inches.

The bridge is very closely watched, and readings are taken every few days in order to reduce the chances of an accident to a minimum.



View showing Kuchen Bridge after temporary repairs completed and bridge tested.

Loco. Superintendent's Report

The following is the report by Mr. J. Alston, Loco. Superintendent :

During the recent hostilities the rolling stock on the whole suffered no severe damage, but owing to the still heavy transport of troops, engines are very hard pressed and no time is available for washing out and repairs.

On the 31st July at 2.30 a.m. a down special from Lin Hui Kwan, loaded with rebel soldiers, had some waggons detached on the main line at the mile 40 North of Chang-pa-lin, owing to the soldiers attaching a rope to the pin of the waggon Janney Coupler. This rope was fastening down a tent inside a high-sided waggon, which flapped about in the breeze, and immediately the coupler slackened owing to the waggon being on the down grade the coupler pin was raised by the tent rope, causing four waggons to be detached and left on line; the night was dark and none of the train staff knew of this occurrence.

Another special train followed the above without electric staff or links,—the soldiers forcing the Station Master to make the train proceed,—this train ran into the waggons left lying on line at mile 49, without serious damage, still another train was sent on by soldiers, consisting of 120 axles, and ran right into rear of second special, knocking five waggons down the bank, killing about thirty soldiers and injuring fifty; the accident happening on a grade of 1-150 down. The rebels at this time were in full retreat from Hsu Chow-fu and in a great hurry to go south, and forced the hands of the railway staff, thus causing such a serious accident.

Five waggons were very badly damaged, Engine No. 28 badly damaged, and since then has been in workshop for extensive overhaul. Engines No. 21 and No. 31 are also damaged owing to soldiers at Peng-pu forcing the driver of No. 21 Engine to move his train when No. 31 Engine was not clear of the cross-over road. A few waggons on the line have had serious end on collisions, but these are as fast as possible being repaired in workshop.

Passenger cars have been badly treated by soldiers; in many cases all interior fittings stolen or destroyed. I have endeavoured to keep as many as possible of the best carriages in the workshop, but owing to the demand for carriages this has been nearly an impossible task; every available carriage and waggon has been working on the line.

Crane for watering locomitives at Pukow wharf was knocked down by a shell from Nanking; a new one has been made in workshop and water supply restored.

The drivers and firemen of the locomotive department have stuck to their work night and day in spite of the fact that at times they were often in very great danger of losing their lives. Driver Li King Tong was shot at by Government soldiers one dark night when approaching Chu-Chou with rebel peace representatives, and has lost the power of one of the fingers of his right hand; he was otherwise badly wounded. Workmen and clerical staff of the Department remained in Puchen throughout the siege of Nanking; the latter coming to office daily and living in one of the arches of Puchen City wall for over three weeks to protect themselves from shells.

No damage has been done to workshop, but shells burst frequently in the yard, fortunately clear of the buildings; owing to the fact that men stayed at their posts in the shops, repairs to rolling stock were executed and engines kept in running order all through the trouble.

The first intimation I had of this recent trouble was on the morning

of the 15th July, when an officer came to my office requesting that all trains to the north were to be stopped,at the same time informing me he was orderedby his General in Nanking to convey this message; in reply I said it was impossible for me to stop the trains without a written statement from some person in authority, and then I proceeded to get the engine out of engine shed at Puchen to run to No. 4 train North; this engine was stopped at works gate by about fifty soldiers, who ordered the driver not to proceed or they would fire. I then wired repeatedly all concerned to keep trains from coming south, but owing to wires being in hands of rebel soldiers this order was not carried out. All incoming trains from north ran to Pukow wharf terminus where rebels detained the locomotives with result that as many as ten locomotives were lying at Pukow without getting water and coal. I interviewed a rebel officer of some kind, pointing out what damage might occur if water in boiler went too low—no person in authority could be found—and after some delay he allowed engines to return to Peng-pu for coal and water.

The first troop special to the North from Pukow with rebel soldiers ran 10.30 p.m. on 15th July, the officers forcing the hands of the traffic staff; since then trains have been running night and day.

On the 29th July, Engineer Mr. Aries wired saying preparations were in progress to blow up the bridge at Peng-pu, and that orders could only be cancelled from Headquarters. I attempted to see General Hwang Hsin in Nanking, but found he was either in hiding or had left, and an interview was impossible, and could get no responsible person in Nanking to cancel the order *re* destruction of bridge.

I then went to Pukow and found a gentleman who represented himself to be the chief staff officer; after a long conversation I pointed out it would be to nobody's benefit if the bridge was destroyed and would handicap the railway for perhaps a year, and also informed him there were persistent rumors that General Hwang Hsin had left and hostilities had ceased; he then informed me that he would wire to Peng-pu and cancel any order for the destruction of the bridge; this wire I saw him send off before leaving. I then wired the engineer at Peng-pu that instructions has been sent informing the responsible parties not to interfere with the bridge.

Miss Chao Mei-sen, eldest daughter of Mr. Chao Ching-hua, who christened the Nanking-Pukow Ferry boat *Fei Hung*

The Nanking-Pukow Ferry-boat

In our last issue we gave a brief description of the new ferry boat *Fei Hung* built to the order of the Tientsin-Pukow Railway, Southern Section, by Mr. Nicholas Tsu The vessel was launched in October, the ceremony being performed by Miss Chao Mei-sen, eldest daughter of Mr. Chao Ching-hua, the Associate-Director of the Railway.

On November 17 a large number of visitors were taken on the *Fei Hung* to Woosung. The vessel made an excellent impression upon those who made the trip and it is beyond doubt that she will be of great convenience to passengers travelling between Shanghai and the North. Hitherto the ferry has been one of the tribulations of the journey "*via* Pukow," but this will all be altered when the *Fei Hung* takes up her running.

On the return journey from Woosung after refreshments a number of toasts were honoured. Mr. Chao Ching-hua in the course of an interesting speech said that the *Fei Hung* was ordered by the directors in view of the increasing volume of passengers making use of the connection across the Yangtsze between the Tientsin-Pukow Railway and the Shanghai-Nanking Railway. Arrangements had been made so that express train services over the Shanghai-Nanking and Peking-Mukden lines would connect direct with those of the Tientsin-Pukow line, thus assuring connexion with the trans-Siberian line for passengers leaving Shanghai for Europe, and when the new schedule came into force it would require only thirty-three hours to make the journey from Shanghai to Tientsin. The journey from Shanghai to St. Petersburg would be cut down to twelve days; to Berlin thirteen days; and to Paris and London fourteen days. As this was decidedly an improvement compared with the former time table, it was expected that it will be welcomed by people who travel from China to Europe and *vice versa*.

It was originally intended to build a bridge across the Yangtrze river to connect the terminals of the Tientsin-Pukow and the Shanghai-Nanking lines, but this plan had to be abandoned because the expense would be enormous owing to the great depth of water and the sandy river bed. The directors had in contemplation the introduction of a train ferry scheme which would convey a whole train of goods and passengers across the Yangtsze, but this scheme had necessarily to be deferred until traffic had increased and ample funds were in hand to warrant such a heavy expenditure. The directors, however, trusted that the day was not far distant when their hope would be realized. The *Fei Hung* could steam at a speed of thirteen knots an hour. The building of the vessel had been superintended by Messrs. Parker & Robb.

The boat is lighted throughout by electricity, the necessary equipment having been provided by Messrs. Andersen, Meyer & Co.

PEKING-HANKOW RAILWAY EXPENDITURE.

The failure of the Ministry of Finance to include in the General Budget the special financial requirements of the Peking-Hankow railway for 1913 has caused the Ministry of Communications to address a despatch to the Cabinet and Finance Minister on the subject, in the following terms:—

"We note that you have not yet included our Special Accounting budget in the General Budget for the second fiscal year. We send herewith another copy. We hear that some people express their surprise at finding that such a huge sum as $9,000,000 will be expended on the Peking-Hankow Railway during the second fiscal year, and criticise the Ministry for making plans that are not in keeping with the financial situation. Such people evidently do not know the actual conditions of the Peking-Hankow Railway, and they are merely impressed by the magnitude of figures without inquiring into the reasons. For instance, the repayments for loans and outstanding accounts amount to three million dollars. The construction of the Chowkiakow-Yencheng branch line requires another two millions. In a word, the sum of nine million dollars as set forth in the budget for the second year is absolutely necessary. We attach hereto a list of the items in the budget for the Kin-Han Railway during the second fiscal year of the Republic."

A.—REPAYMENTS.	
Redemption Loan	$1,370,000
Repayments due Chuanhan Railway	1,500,000
Land purchase debt	122,017
B.—ROLLINGSTOCK.	
Locomotives	108,300
Passenger Cars	378,950
Goods Train	1,023,053
C.—MACHINERY.	
Traffic Dept.	46,725
Workshop	178,600
Maintenance Dept	86 950
Outstandings	615,958
D.—CONSTRUCTION WORK.	
Head Office	17,500
Traffic Dept.	670,005
Workshop	97,544
Maintenance Dept.	129,650
Repairs Chienmen Wall, and filling moat	250,000
Fund for Huangho Bridge.	1,000,000
E.—BRANCH LINES.	
Chowkow-Yencheng	1,750,000
Changsintien-Tahuichang	350,000
Tax on materials	8,000
Grand Total	9,703,252

COMMISSION TO UNIFY RAILWAY ACCOUNTS

(*Continued on page 224.*)

anything with the operating accounts. Mr. Middleton of the Shanghai-Nanking Railway, who is familiar with the Indian system of Railway accounting, explained the uniformity and advantages of that system. Though differences of opinion naturally existed, as there were members representing different accounting systems, it was finally agreed to accept the Indian system of Railway Accounts as a basis of discussion, after Dr. Adams moved to that effect. Each heading and each item of construction account was thoroughly examined. In addition to comparing these with similar headings and items of the Belgian, French, German, Swiss and American systems, the Commission gave special attention to conditions and requirements in China, and after much hard work and careful deliberation major and minor headings of a Construction Account were drafted and provisionally accepted.

Before retiring, Mr. Henderson, on behalf of the members, proposed a vote of thanks to Dr. Wang for so ably conducting the conference. The meeting adjourned at 4 p.m., (Saturday, 22nd Nov.) until some future date which shall be fixed by the Chairman.

THE FOREIGN TRADE OF CHINA FOR 1912.

BY MR. W. P. KERR, BRITISH COMMERCIAL ATTACHE

In one respect the course of foreign trade in 1912 offered a marked contrast to that of 1911; for while 1911 was a year of successive disappointments, the year 1912, opening with the gloomiest possible prospects, closed nevertheless with a record value of foreign trade to its credit. Throughout the first six months of the year traders, as well as Chinese authorities, were hampered by the prevalent financial stringency, and watched with interest the vicissitudes of the negotiations for a big foreign loan, which it was hoped would relieve the market and inaugurate an era of commercial prosperity. The negotiations came to nothing, while, on the other hand, merchandise ordered in advance during the hopeful times of 1911 kept piling up without an outlet, until on June 30 stocks of piece-goods in Shanghai were estimated at nearly 9,000,000 pieces, against 7,000,000 pieces at the beginning of the year.

This depression in the import trade was partly due to the unrest in the country, nearly every province suffering in more or fewer of its districts from the ravages of brigands and of mutinous soldiery. That want of money, however, rather than want of security, was the main cause of the dulness of trade, is shown by the fact that native produce continued to come down from the interior in almost as great volume as in normal years. When the time came for sending money up country to buy cocoons and tea, arrangements were everywhere made with unexpected facility for securing safe transit; and altogether the trade with foreign countries suffered wonderfully little from the direct impact of the forces of disorder let loose by the revolution. The general restriction of credit, however, continued to operate to the disadvantage of trade, aggravated as it was by the action of the provincial authorities in trying to force the use of paper money on the people. Foreign goods had to be paid for in cash, and safe as this method may be, it is inconsistent with large business. It was soon realised what a useful function is performed in normal times by the credit facilities afforded by the native banks, in spite of the risks due to their faulty constitution. In these circumstances it was noticeable that the system of weekly auctions of piece-goods at Shanghai was a prominent feature of the trade of that port from the end of February, when auctions were resumed, after 19 weeks' interval, throughout the rest of the year.

IMPROVEMENT IN LAST QUARTER.

The hand-to-mouth character of the import trade continued until the beginning of October, when the harvesting of splendid crops in nearly every part of the Republic (the provinces of Shansi, Shensi, Yunnan and the north of Shantung being the only noticeable exceptions) resulted in a general strengthening of credit, and a marked improvement in the demand for foreign goods set in. It is noteworthy that in Szechuan alone the market failed to respond to the excellent harvests produced, all spare silver being drained from that province by costly military expeditions to Thibet. The situation as regards imports generally was distinctly hopeful at the end of the year. It is true that owing to the heavy imports of the earlier months the stocks of piece-goods in Shanghai were only 500,000 pieces below the figure at the beginning of the year; but the rate of consumption being considerably in excess of the rate of new arrivals, the position in December was essentially different to what it had been in January

EXPORTS AND EXCHANGE.

As regards exports, it has been already remarked that the disturbed state of the country districts during the earlier part of the year had not so serious an effect as might have been anticipated, and was amply compensated by the unusually fine harvests. It will be seen that the silver value of the native produce exported, though less than in the two preceding years, was well over the average of the previous three or four years, and that the sterling value constitutes a record. As prices were generally low, the volume must have been unusually large, and it is to be noted that this increase was effected in the face of a substantial rise in exchange, the average value of the Shanghai tael during the year being 2s. 9d. against 2s. 4 11-16d. in 1911. The rise in exchange followed closely the price of silver in the world's market, which increased continuously from a minimum of 2s. 5 3-16d. per ounce in January to a maximum of 2s. 9 11-16d. in December. A high exchange is naturally unfavourable to exports from China, but the experience of 1912 only serves to emphasise the fact that imports do not suffer from a low exchange nor exports from a high exchange nearly so much as both imports and exports suffer from violent fluctuations in the price of silver.

LOAN NEGOTIATIONS.

After a brief recital of the history of the long-draw-out loan negotiations, Mr. Kerr remarks:—A perusal of the reorganisation loan agreement, which was finally signed on March 26, 1913, will show that after payment of existing liabilities, disbandment of troops, reform of the salt gabelle and current expenses of administration for six months, there is not a penny left for productive works or any other purpose. All this is, of course, well known to those who have followed the course of events in China during the last few months, but as misapprehensions, based no doubt on the originally proposed amount of the loan, appear to exist still in some quarters, I mention the matter with a view to forestalling any disappointment that may be felt if the commercial benefits accruing from the successful issue of the loan negotiations do not reach the level of the anticipations previously indulged in.

EXCESSIVE ISSUE OF PAPER MONEY.

A further point of commercial interest that has to be noted in connection with the reorganisation loan, is that none of the proceeds will be directly available for the redemption of the excessive amount of paper money mentioned above as having been issued by the provincial authorities. The deplorable effects of this reckless issue of "military notes" are dwelt on in reports from several provinces. In Kwangtung the amount in circulation in March, 1913, was admittedly $30,000,000, and it was estimated that another $10,000,000 might be added on account of duplicates and forgeries. The average purchasing value of the Canton Republican Government notes in the last four months of 1912, in comparison with Hongkong, was as 120 to 100. In Hunan the notes issued by the provincial government are said to be valid for payment of taxes and other contributions for public purposes, but not exchangeable for silver or copper either on demand or at any fixed date. These new issues brought the total liabilities of the Hunan Government in paper money issued under the present and under the Manchu *régimes* up to a total of over $21,000,000, and the monetary difficulties of the province were further aggravated by a reckless issue of unsecured notes by private banks. Remittances from Changsha to Hankow at the end of 1912 could be effected only at a discount of 30 per cent — a rate which has since risen considerably higher. The provincial note issue in Szechuan, originally $3,000,000, was increased before the end of the year to at least $10,000,000; 30 per cent. of notes are declared to be legal tender in any commercial transaction, and in March, 1913, these notes were passing freely at a discount of 10 per cent. In other provinces the same evil is prevalent, though on a smaller scale, and it is clear that the redemption of notes is not the least of the problems for which a solution must be found before the chaotic finances of the provinces can be reduced to order.

OPIUM.

The foreign opium imported in 1912, that is the opium released from bond on payment of duty at the several ports, amounted to approximately 19,968 chests against 24,928 chests in 1911. The value given in the returns is about Tls. 500,000 less than in 1911, but the higher rate at which the tael is reckoned makes the sterling values show an increase of nearly £800,000. Prices went down seriously in the course of the year as the result of the severe anti-opium measures adopted by the Chinese authorities, and the trade was a disastrous one for all concerned. The opium agreement of May 8 1911, referred to in last year's report, was designed to bring trade gradually to an end by decreasing the export of opium from India to China concurrently with the diminution of production of the native drug, and several outlets were duly closed as one province after another was examined and found to be free from poppy cultivation and from import of native opium. In addition, however, to this legitimate restriction of the traffic, the foreign opium importers suffered from the high-handed action of various local authorities, who, in spite of a considerable recrudescence of poppy cultivation in many provinces, resorted to unwarrantable interference with the retail trade in opium. At the time of writing negotiations are going on between the British and Chinese Governments respecting the questions of revising the 1911 agreement and disposing of the accumulated stocks. The stocks in hand at Shanghai and Hongkong on April 30, 1913, amounted to 22,650 chests, exclusive of 2,760 chests at Bombay due for shipment to China. Among minor items of interest connected with the opium trade of 1912 may be mentioned reports by His Majesty's Consular officers at places so far distant from each other as Chefoo, Shansi, and Swatow of excessive speculation by Chinese dealers in opium. In the two ports last named these speculations proved completely disastrous

IMPORTS

Cotton Piece Goods.—As regards the quantities of the principal classes of plain cotton piece-goods, i.e., shirtings, sheetings, drills, jeans, and tea-cloths, imported into China, the total decrease of 1,540,475 pieces in 1912 compared with 1911 will be found, on examination of the detailed figures, to be largely accounted for by the decreased import of British grey shirtings, which fell from 4,697,817 to 3,210,531 pieces. Japanese makes are the only ones that show a continuous increase, the most remarkable increase being in Japanese grey sheetings, which have risen steadily from 258,000 pieces in 1908 to 1,945,000 pieces in 1912, or double the number of Japanese drills, which were formerly the characteristic class of the plain cottons from that country. The effect of Japanese competition is thus felt more keenly by American than by British cotton goods.

Cotton Yarn.—The total import of cotton yarn amounted to 306,000,000 lbs. as compared with 248,000,000 lbs. in 1911. The increase was mainly in Indian and Japanese yarn, in both of which classes business was dull during the first half and brisk during the last of the year. In spite of the greatly increased import of Indian yarn, the trade in this yarn cannot be considered satisfactory. The competition from the Japanese and especially from the Shanghai mills grows keener every year, and many complaints are heard that as to qualities and weights the Bombay yarns are inferior to the Japanese and Chinese. The number of spindles in China in December last was reckoned at about 900,000, of which more than half were situated

in Shanghai. Several thousand more have been added in Shanghai since that time.

Machinery.—The total value of all kinds of machinery and parts fell from £855,202 in 1911 to £689,102 in 1912. It was remarked in last year's report that the unsettled conditions caused by the revolution had rendered the outlook in the machinery business extremely uncertain, and the decrease is no more than might have been expected in view of the dearness of money in China throughout the year, which combined with other causes to check the expansion of industrial enterprises. There was an increase, however, of £25,835 in the value of machinery for textile purposes, the prosperity of the cotton spinning and weaving industry having, as already indicated, formed a marked exception to the general depression. The machinery under this sub-head all comes from the United Kingdom.

The import of embroidering, knitting, and sewing machines more than trebled in value. Attention has already been drawn, in connection with clothing, to the extended use of knitting machines in the south of China. It is noted in the Consular report for Yunnanfu that the trade in sewing machines has made great progress in the province of Yunnan, and that in many cases the machines are successfully sold on the hire-purchase system.

EXPORTS

Beans.—The export of beans to foreign countries in 1912 was considerably below that of either of the two previous years. It was observed in my report for 1908 that the combination of favourable circumstances which attended the first season of the direct trade in soya beans from Manchuria to Europe could not reasonably be expected to occur frequently. Altogether the bean trade in Manchuria has had to struggle through hard times during the last two or three years, and most of the British firms that entered in the competition at the beginning have either withdrawn or curtailed their operations, finding that the necessary organisation of agencies in the interior and the local system of advance payments for produce eat too deeply into the profits. The shipment of beans from Harbin to Vladivostok are said to have amounted to only 344,000 tons (of 2,240 lbs.) in 1912 against 416,000 tons in 1911. The beans exported by steamer from Dairen fell from 235,000 tons in 1911 to 157,000 tons in 1912. As for the export from Newchwang, the third seaport of outlet from the Manchurian provinces, the decline was still greater than from Vladivostok or Dairen, and the year 1912 marks a further stage in the process by which that port is being gradually supplanted by its more progressive rival in the Japanese leased territory.

Silk.—The exports of raw silk, white and yellow, amounted to over 16,250,000 lbs., exceeding by 1,559,000 lbs. the previous record of 1910. Although the volume was so great, the high rate of exchange resulted in loss instead of profit to Chinese dealers. A remarkable feature of the year was the greatly increased export of raw silk to British India. The Indian statistics give the import of raw silk from China in 1912 as 3,271,000 lbs. against 2,030,000 lbs. in 1911. The demand from Europe and America, which was dull in the first half of the year, became active in the third quarter, and the business done with all the principal consuming countries was greater in 1912 than in the preceding year. There is, unfortunately, no improvement to chronicle in the Chinese methods of sericulture, the backwardness of which has repeatedly been made the subject of remark in this series of reports.

Tea.—The total quantity of tea exported in 1912 was 197,559,867 lbs., valued at £5,154,588, against 195,040,400 lbs. valued at £5,161,300 in 1911. A decrease of over 11,000,000 lbs. in black tea was counterbalanced by an increase of 12,000,000 lbs. in green and brick tea. The decrease in black tea is chiefly due to the serious decline of direct exports to the United Kingdom, Hongkong, and the United States, caused by the large supplies from India, Java, and Ceylon. The export of black tea from Java is already over 70 per cent. of the export from China, and is steadily increasing. Owing to the relaxation of the Pure Food Act, the export of green tea to the United States was more than doubled. The Mediterranean ports also took twice as much tea from China as in 1911, chiefly on account of the growing popularity of tea on the Continent. There was a decline of shipments to the European ports of Russia, which may be attributed to the indigestion of the Batoum market caused by the excessive imports of 1911. Although the figures for 1912 compare not unfavourably with those for the previous year, there is a general feeling that the China tea trade is on the wane. Various causes are assigned to this falling-off. There is a tendency amongst cultivators to aim at quantity rather than quality, and much reckless competition is indulged in by the middlemen for the raw leaf, resulting in unduly inflated prices.

In spite of predictions to the contrary there was a very large crop of both black and green teas in the Hankow and Kiukiang districts at the beginning of the year, though most teas were interfered with by the spring drought. Far more tea was produced, however, than was wanted, with the result that the markets in many parts of the world were rapidly overstocked. Chinese teas have failed to maintain their popularity in the United Kingdom, and Russia is taking more and more to the Indian teas.

SHIPPING.

The substantial increase of British tonnage in 1912 is noteworthy in view of the fact that the prosperity of shipping in the rest of the world drew off most of the tramp steamers from the China seas, and left the coast free to the regular shipping lines. It is evident that the latter must have been to a welcome extent compensated by the activity of the carrying trade in 1912 for the unprofitable nature of their exertions during the last few years. Steamships have profited at the expense of native junks in many waters from unsettled conditions prevalent, which resulted in the transference to the former, for greater safety, of cargo usually carried by the latter. On the Siang River, the chief waterway of the province of Hunan, the steamship companies were actually unable to cope with the abnormal volume of trade between Changsha and Hankow.

INDUSTRIAL DEVELOPMENT

As in the case of railways, the year 1912 was prolific in paper schemes for manufactories of all kinds. The Province of Hunan was, as usual, to the fore in company promoting, and the industrial projects recently discussed there include paper factories, cotton spinning and cloth weaving mills, flour milling and rice hulling establishments, a cement factory, a timber-sawing factory, a cigarette factory, and a glass factory, besides such further enterprises as leather boot making, hat making, dyeing, printing, silk reeling, and the manufacture of sugar and felt. The lack of native capital, and the opposition of foreign capital, preclude in nearly every case the possibility of carrying these projects into effect; indeed, the only ones which appear to have passed beyond preliminary stages are a boot-making factory started in January, 1912, a glass factory established on a small scale for the manufacture of bottles, lamp glasses, &c., and a cotton mill at Changsha, for which a site has been secured.

The list of factories reported as having been actually opened in 1912 is a small one; in addition to the above may be mentioned a leather factory at Chungking, a weaving factory and a flour mill at Shansi, and Franco-Chinese tannery at Tientsin. The installation of machinery for tin smelting works at Ko-chiu in Yunnan was completed, but operations have not yet begun.

MUNICIPAL PROJECTS

A new and powerful electric light plant was erected in 1912 in the French extra concession at Tientsin. Electric light was installed at Yunnanfu, and there are electric light projects at various stages of advancement in a dozen other cities. It was decided two or three years ago to have a system of electric tramways in Peking, and foreign financial assistance has been promised from many quarters, but the terms of the concession are apparently such as to preclude the use of foreign capital, and no progress is made. Canton has also a big tramway scheme under consideration, not to mention projects for hydraulic power, new roads, and other city improvements. Very few cities in China have waterworks or drainage system, although these are much more necessary than electric light; the difficulties of finance seem to be at present insuperable. For all municipal undertakings of this nature British and other capitalists and manufactures are only too willing to co-operate; but municipal institutions are so inchoate in China that only in rare instances can proper security be granted for the employment of such capital. The Consul at Hangchow, in his report for 1912, has called attention to the inherent weaknesses of industrial organisations in China, the insufficient capital on which business is started, the wasting to reserves, and the amateurish methods of administration. These remarks are just as true of municipal enterprises as of railways, mines, and factories.

As regards the development of the resources of the country the Chinese argument is that as foreign capital cannot be obtained except under conditions of foreign supervision and control, which leads to loss of independence, therefore none but Chinese capital can be employed. But the result of the use of Chinese capital with Chinese methods as above described is that Chinese capital is no longer forthcoming, and the argument becomes what the old logicians called a "vicious circle." The fallacy lies in the failure to differentiate between the necessary degrees of supervision and control. In the case of railway construction, and in certain other exceptional enterprises, a solution has already been found, and it may be expected that experience will teach young China that in all industrial undertakings a certain modified degree of foreign control is for the present necessary. After all, the danger of the loss of independence lies not in the subjection to foreign supervision in specified industries, but in the failure to redeem obligations to foreign Governments—a failure which in present circumstances seems inevitable unless the natural resources of the country can be successfully exploited.

MILITARY WIRELESS TELEGRAPHY

The Japanese War Office has on foot a scheme to organise a Wireless Telegraphy Corps. According to the *Asahi* the Wireless Telegraphy Committee, which has been working in co-operation with the Aviation Committee, has now completed one stage of its work, and the time has arrived for putting its investigations into practice. The War Office has therefore decided to organise a Wireless Telegraphy Corps, and has included a vote for this purpose in its estimates for next year. For the present two wireless telegraphy companies will be organised. The Wireless Telegraphy Committee will not be dissolved, but will continue its studies of military telegraphy.

AMUR RAILWAY

H. M. Embassy at St. Petersburg reports that the official "Bulletin of Laws" publishes two laws respecting the Amur Railway, which is now under construction. The first of these sanctions the expenditure of £2,180,000 for purchase and delivery of rolling-stock, of which the maximum expenditure during 1913 is to be £1,058,200, and the second increases the original estimated cost of the construction of the Eastern section of the railway from £7,501,305 to £7,931,535.

TRUSSED CONCRETE STEEL COMPANY

THE PLANT AT YOUNGSTOWN, OHIO

The extensive plant of the Trussed Concrete Steel Company at Youngstown, Ohio, is devoted exclusively to the manufacture of steel products, such as United Sash, Kahn Trussed Bars, Hy-Rib, Rib-Lath, Reinforcing Steel and other Building Specialities. The Waterproofing and Finishing Products of this Company are manufactured in a separate plant in Detroit, while Tile Plants and warehouses are located in various cities of the country. The main Executive and Sales-Offices are located in Detroit with representatives in all principal cities.

Six years ago only a few small buildings made up this entire plant. To-day the factory and yards cover the greater part of twenty-five acres of land. The plant consists of an administration building, power-plant shipping yard, and a large number of individual buildings, in which the various products are manufactured. In order to more clearly understand the development of the Plant and its manufacturing divisions it is well to review the products of the Trussed Concrete Steel Company and their development.

Originally the Kahn Trussed Bar was the principal product of the Company. The Kahn Trussed Bar is a patented reinforcement for use in concrete girders, beams, joists and floors, and consists of a main horizontal bar with rigidly connected diagonal shear members, formed from the same section of steel. Other reinforcing products were introduced shortly afterwards. These included the Rib Bar with a specially rolled section, so formed as to secure a positive grip in the concrete; Rib Metal, an improved type of Expanded Metal, formed from a special section of steel and consisting of a series of bars, rigidly connected by cross ties; Column Hooping, completely built up, and collapsible for convenience in shipping, etc.

The next important development of this Company was the invention of Hy-Rib, an entirely new type of reinforcement for concrete and plaster work. This material consists of a series of deep-ribs, connected by a specially expanded fabric, all formed from the same sheet of steel. The object of the ribs is to give stiffness to the reinforcement, so as to do away with forms when used in floors, roofs or walls, and to take the place of metal studs in partitions, sidings, ceilings, etc. Coincident with the invention of Hy-Rib, Rib-Lath, an improved expanded metal lath, which is on the same general principle of Hy-Rib, was introduced, as well as Rib-Studs for hollow walls and partitions.

The most recent development in the growth of the plant is the manufacture of United Sash for use in windows, monitors, partitions, etc. This steel sash is built on an improved principle of assembling which gives exceptional strength and efficiency to the construction of the sash. All types of sash are made, including standard pivoted side wall sash, vertical sliding sash, center pivoted and top hung continuous sash, steel and glass partitions, steel doors, etc.

Bearing in mind these facts and considering the necessary shipping yards, storage, stock rooms and receiving stations to handle this large and varied output, the reader will be able to understand the plan of the factory. At the extreme left of the bird's-eye view is shown a portion of the shipping yards for the Kahn Bars, Rib Bars and Reinforcing steel, containing large cranes, stock yards, cut-off presses, etc. The shearing of the Kahn Bars is done in an adjoining building. Here are found presses weighing twenty-five tons a piece, and with a capacity of two hundred and fifty tons for forming the rigidly connected shear members of the Kahn Bars. The dies for shearing these Kahn Bars weigh about five thousand pounds a piece.

The Rib Bar Department is in close conjunction with the Kahn Bars, and is completely equipped with shearing presses, bending machines, locomotive cranes, etc., to supply the Rib bars in any form desired. The Column Hooping is manufactured also at this part of the Plant. The Rib-Metal material reaches the shop in the form of a washboard shaped section, which is run through punches of three-hundred ton capacity, and is then expanded into the finished material.

The building for the Hy-Rib and Rib-Lath Manufacture are next adjoining and are provided with railroad siding, loading platforms, etc., for shipping purposes. In these buildings the flat sheets of steel are first especially prepared, beaded, trimmed and made ready for the punching press, which with special dies cuts the material as desired. The sheets next go to the heavy forming presses, which by a process of pressing and expanding develop the product into its finished form. The Hy-Rib material is also furnished by the shops in curved sheets; the curving being done with special bending machines.

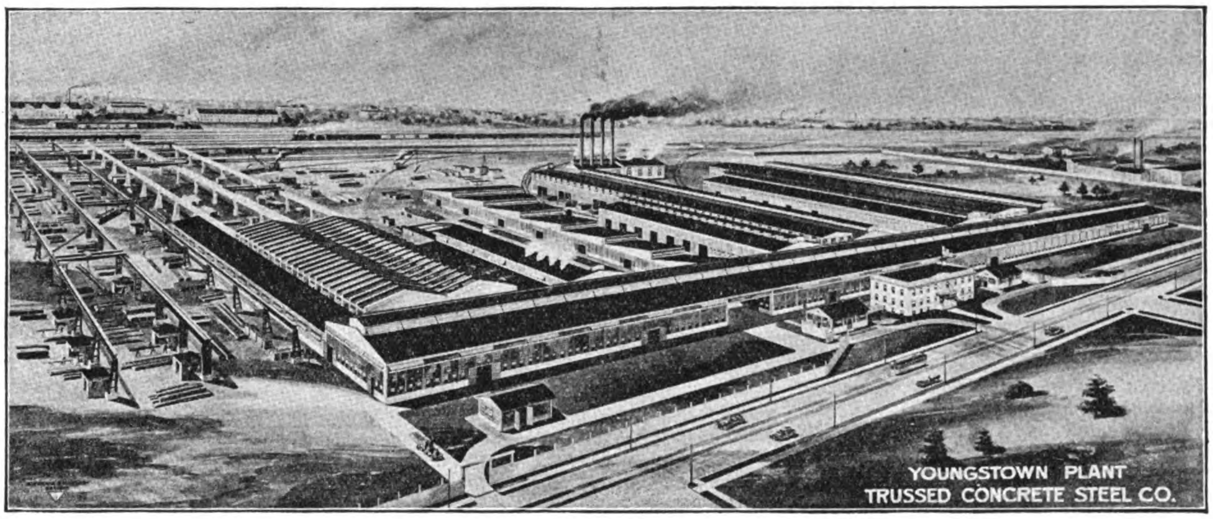
The United Sash Department includes a large number of buildings, owing to the great demand for this product, and the amount of space necessary for its manufacture. In this Department steel sash sections are combined under powerful presses into the finished sash. Practically the entire sash is machine-built, the joints, etc., being finished with pneumatic hammers. The presses used have a capacity of four hundred and fifty tons pressure, and weigh a hundred and twenty thousand pounds each. The processes of manufacturing requires an extensive series of presses for notching, shearing, and assembling besides many other finishing machines.

In the flore dome and floretyle division, which is one of the recent developments, are manufactured deeply corrugated steel domes and tyle for the use in floor construction in place of terra cotta tile. These are pressed out under special dies and powerful presses to the desired form.

The Machine Shop in conjunctiin with the plant is completely equipped to manufacture all various dies and tools necessary for the manufacture of the Kahn Building Products. Many of these are very complicated, consisting of as many as a hundred pieces with eight different cutting edges. To insure the accuracy of the finished product, these dies must be ground to a ten-thousandth of an inch fineness. The Power plant is located in the rear, and the Administration Building containing Order-Department, Drafting Rooms and Shop Offices is located in the front. Special Time Office Building and Garages are also indicated in the front. Complete switching and shipping facilities are provided and connected directly with the main line of the railroad, so as to handle the incoming and outgoing material in the shortest time possible.

The general construction of the buildings is along the most modern ideas of fireproof and daylighted factories. Practically the entire side-walls are made of United Sash with a small curtain wall underneath of Hy-Rib concrete construction. The buildings are constructed with long span trusses, so as to give the greatest convenience in handling material, while the roofs are built of Hy-Rib concrete. Many of the buildings are provided with monitors, which are equipped with continuous United Sash.

This plant of the Trussed Concrete Steel Company is an excellent example of modern efficiency, both in equipment and construction. The General Executive and Sales Offices of this Company have their head-quarters in Detroit, Michigan, while the steel manufacturing plant is located at Youngstown, Ohio, for its convenience of the steel markets.



YOUNGSTOWN PLANT
TRUSSED CONCRETE STEEL CO.

THE PROPOSED SINYANG-PUKOW RAILWAY

(*Continued from page 225*)

exist in the districts near the line, will be developed and afford considerable income to the railway.

The gentry of Anhui have been very anxious to see the railway constructed, primarily for the benefit of the country and secondly for the immediate benefit of the thousands of distressed people who could earn a livelihood on the construction work. The gentry, in fact, memorialised the Parliament to consent to the signing of the agreement as speedily as possible so that work might be commenced with the latter object in view.

Immediately financial arrangements can be made the concessionaires will commence active operations.

FAR EASTERN RAILWAYS

CHINA

Canton-Hankow Railway.—A landowner who is demanding an exorbitant price for a wedge of land outside Wuchang and on the route of the Hankow-Canton railway is proving the last obstacle to the commencing of construction in real earnest at the end, says the *Central China Post* of October 31. As to finances a full agreement was reached between the railway and the leading banks on September 12 and since the staff has been ready to begin construction on the Wuchang-Yochow section. The land near this centre has all been bought, with the exception of once piece outside Wuchang. Negotiations for the purchase of this are going on, and it was expected that an agreement would be reached by the next week. The definite date of commencing construction will have to be decided by Mr. Feng Yuen-ting, Inspector General of the railway, who was then in Peking.

Preparations have been also made to start work from Yochow at the same time as at Wuchang, Mr. Sinclair having gone up river to supervise the work. Parties to buy the necessary land between Wuchang and Yochow are at present out, but have met with a check in consequence of the theft of marking posts. In some parts the marks showing the surveyed route have disappeared, necessitating a further survey. However, it is stated that everything is being done to hurry on matters, and where possible telegraph lines are being put up; a telegraph expert from Peking accompanying the survey parties. The route of the British section has been mapped out as far as Yichang hsien in Hunan, while the construction of the section in Canton province will have reached a point about seventy miles from the Hunan border by the end of the year. In consequence of the mountainous condition of the country on the border of the provinces work on the Kwangtung section will stop till the British section is completed, which, it is expected, will be in three or four years' time.

The main terminus station at Wuchang will be at the Wuchang Creek, below the city and opposite the Hankow Concessions. There will be another station at an important market village above the cotton mills. Work has already been started on the branch line, about two miles long, which runs to this station. When the line is completed there will be a connecting link between the main station at Wuchang and the Kin-han railway. Nothing has as yet been decided, but it is expected that the river will be crossed by a ferry service.

Canton-Macao Railway.—The Canton daily *Yun Kun Po* learns that the Government has arranged for a loan of $15,000,000 with a certain group of English capitalists for the construction of the Canton-Macao Railway. The agreement is on the lines of the Tientsin-Pukow Railway loan contract, with the exception that the rate of interest will be a little higher. The contract, it is said, will be shortly signed. The projected line will pass through the towns of Tong Chune, Chan Chune, Yung Tsai, Heung Shan and Tsin Shan, and will be about 149 miles in length. In the 28th year of Kwangsu, a convention was signed by Hsing Hsuen-huei and the Portuguese Ambassador, by which it was agreed that the line should be constructed jointly by China and Portugal with a capital of Tls. 2,000,000, but this was cancelled towards the end of the 31st year. Subsequently a number of Canton merchants obtained permission from the then Board of Communications to raise a capital of $6,000,000 to construct it as a "mercantile line," but, owning to the prolonged negotiations for the delimitation of the Macao boundary, the matter has been in abeyance ever since.—*H. K. Daily Press.*

The Kiangsi Railway.—The Shanghai correspondent of the *Tokyo Nichi-Nichi*, reports the *Japan Daily Mail*, calls attention to a movement just started among the Chinese for the nationalization of the Kiangsi railway, and says:—

The Kiangsi railway is to connect Kiukiang and Nanchang with Japanese capital, in accordance with the contract for a railway loan already concluded, and the work is to be carried out under the suppervision of Japanese engineers and experts. The work is not yet completed. It is the only line in the Yangtsze Valley in which Japan is directly interested. The Kiukiang-Tehan line, the part of the railway so far completed, was utilized by the Southern and the Northern troops during the Second Revolution for the transport of provisions, and sustained no small damage to the rolling stock and railway buildings. In the course of the month of August this year, the Eastern Asiatic Industrial Company of Japan, which is in the position of creditor, approached the Railway Company with a request for an investigation of the losses sustained by the line and at the same time for an interview with the President of the Company, Mr. Wu Fang, in order to confer with him as to the future of the railway. This proposal for negotiations, of course, had in view the early completion of the whole line, as well as the maintenance of the rights of the creditors. The request was acceded to by the Railway Company, Mr. Chao, Director of the Company, going to Shanghai to conduct the negotiations on behalf of the President, who was prevented from attending on account of business. The result of the conference between the representative of the Eastern Asiatic Industrial Company and the Director of the Kiangsi Railway Company has not yet been made public, but according to information obtained from a reliable source, the Japanese Company appears to have proposed that the work of railway construction should be expedited under the superintedenoe of an increased staff of Japanese experts and engineers, and also that the loan required for the completion of the whole of the railway should be concluded with the Industrial Company, on condition that this Company's representative be appinted Financial Supervisor of the Railway Company. On account of the serious importance attaching to the latter proposal, the negotiations were not concluded at Shanghai and were transferred to Nanchang, where the head office of the Railway Company is situated. Here, however, the negotiations made no progress, on account of the opposition of the Railway Company, coupled with the distressed condition of the money market. The fact is that from the beginning some of the shareholders took exception to the conclusion of the railway loan with Japan, and upon the introduction of Japan's further proposal concerning the railway, they renewed their opposition, obtaining additional strength because of the change in the general circumstances which prevented the Railway Company accepting Japan's proposal for the early completion of the line by means of further loans. Thus the majority of the shareholders agreed in concluding that it would be advisable for the Railway Company to sever connection with Japan once and for all at this opportunity, or at least not to enter into any further connection. In the meantime Mr. Li Sheng-to in Peking was preaching the advisability of concluding Belgian loans if China felt the necessity of raising foreign loans, and influenced by him, as well as by the leading shareholders, the Railway Company at a general conference of shareholders, held in the latter part of September, passed the resolution proposing the nationalization of railway. According to the explanation offered by the President, Mr. Wu Fang, at that conference, the Kiangsi railway is divided into five sections, of which only the first section leading from Kiukiang to Tehan is completed. Once the line is extended as far as Hsuchapu from Tehan, the completion of the further sections will be attended with little difficulty, waterways facilitating the transport of construction materials. To connct Tehan with Hsuchapu, however, as many as three railway bridges must be constructed which means a large expenditure. In these circumstances the completion of the whole line requires an additional capital of three million dollars, or means a deficit to the amount of well nigh 1,800,000 dollars, the funds now at the disposal of the Company exceeding scarcely 1,200,000 dollars. Mr. Chao Wei-hsi, Vice-Civil Goveonor of Kiangsi, who was also in attendance at the general meeting, in the course of a speech stated that the Peking Government would certainly take upon itself the completion of the Kiangsi railway in order to ensure the maintenance of China's rights of exploiting her natural resources. If the Railway Company considered it necessary to extend the line from Tehan to Hsuchapu and Pinghsiang, it would be highly advisable that the Company should prefer a Belgian loan to other foreign loans, because Belgium had no dangerous ambitions, her sole aim being the acquirement of a sound investment.

These circumstances now unmistakably indicate that the relations between Japan and the Kiangsi railway are gradually growing slacker, and in view of the fact that all restrictions hitherto placed on economic loans in China have been removed, the situation in regard to the Kiangsi railway deserves careful consideration by those Japanese who aspire to play any active part in the international economic arena of the Chinese Republic.

The Honan Railway.—Actual work has begun on the railway which is to link Kaifeng to the Tientsin-Pukow railway at Hsuchowfu and will bring Kaifeng within about two days of Shanghai, writes the Kaifeng correspondent of the *C. C. Post* on the 11th instant. The work is being pushed from both ends, and it is estimated that trains will be running from Kaifeng to Hsuchow in a year and a half. The section from Hsuchowfu to the sea will be completed later.

It would be difficult to conceive of a line anywhere on earth that will be cheaper or easier to build than this. The land is level and there are no large rivers to cross; the work for the embankments is contracted for by small contractors, and there would seem to be no difficulty as far as labour is concerned. The latter is cheap and reliable—or as reliable as any of that class to be found. One can but wonder where American and British railwaymen were when they permitted the Belgians and French to obtain such an easy contract. Still there are large sections of the great central plain that need railways and where railways will be built. Certainly British and American engineers should be on the lookout for such golden opportunities as these, comments the correspondent.

On the western end, however, the country is more rugged and mountainous. A native company has been building a line from Honanfu to Tungkuan. In three years they have built about a hundred li of road, but their line has been acquired by the Belgians and French, who will extend it on to Sian and eventually to Lanchow, thus completing the grand trunk line across China from Kansu to the sea.

Shanghai-Nanking Railway.—The following figures of traffic returns (approximately) for the week ended October 18 are issued by the Shanghai-Nanking Railway:—

Year.	Passengers.	Goods and Sundries.	Total for the week.
	$	$	$
1913	55,891	13,225	69,116

1912	42,271	9,611	51,882
Increase.	13,620	3,614	17,234
Decrease	—	—	—

For forty-one weeks.

Year.	Passengers.	Goods and Sundries	Total
	$	$	$
1913	1,907,174	407,434	2,314,608
1912	1,816,635	321,040	2,137,675
Increase.	90,539	86,394	176,933
Decrease	—	—	—

Week ended October 25.

Year.	Passengers.	Goods and Sundries	Total for the week.
	$	$	$
1913	56,494	12,455	68,949
1912	40,263	9,926	50,189
Increase.	19,231	2,529	18,760
Decrease	—	—	—

For forty-two weeks.

Year.	Passengers.	Goods and Sundries	Total
	$	$	$
1913	1,963,668	419,889	2,383,557
1912	1,856,898	330,966	2,187,864
Increase	106,770	88,923	195,693
Decrease	—	—	—

Week ended November 1.

Year.	Passengers.	Goods and Sundries.	Total for the week.
	$	$	$
1913....	52,824	12,081	64,905
1912....	40,531	9,747	50,278
Increase.	12,293	2,334	14,627
Decrease	—	—	—

For forty-three weeks.

Year.	Passengers.	Goods and Sundries.	Total.
	$	$	$
1913....	2,016,492	431,970	2,448,462
1912....	1,897,420	340,713	2,238,142
Increase.	119,063	91,257	210,320
Decrease	—	—	—

Week ended November 8.

Year.	Passengers.	Goods and Sundries	Total for the week.
	$	$	$
1913....	52,208	10,155	62,363
1912....	35,232	7,638	42,870
Increase.	16,976	2,517	19,493
Decrease	—	—	—

For forty-four weeks.

Year.	Passengers.	Goods and Sundries.	Total
	$	$	$
1913....	2,068,700	442,125	2,510,825
1912....	1,932,661	348,351	2,281,012
Increase.	136,039	93,774	229,813
Decrease	—	—	—

JAPAN

Foreign Loans Required.—The cost of the railway scheme which it is proposed to commence next year and to be completed in eleven years, is estimated at Y162,870,000, consisting of Y95,460,000 for construction of new lines and Y67,410,000 for improvement of existing lines So much of this sum as is not realisable from profits of working, must be raised by means of bonds in accordance with the Imperial Railway Special Accounts. In accordance with the Government's financial policy and the condition of the money market, the amount by which the railway revenue fell short of the demand has been drawn from the Deposits Bureau during the past few years; but the increase shown in the deposits in the Post Office Savings Bank, which form the most important part of the Deposits Bureau funds, has not been so satisfactory as was expected by the Government last year.

In March last the Government raised a foreign loan of Y100,000,000, and redeemed the short term Railway Notes issued in Japan, besides settling a part of the indebtedness of the Railway accounts to the Deposits Bureau. The loan, in fact, was only sufficient to settle debts, and the question how to raise the funds required for the forthcoming railway programme still remains unsettled.

In the opinion of an official responsible for the solution of the problems, quoted in the *Asahi*, the only course available for the Government to tide over the difficulty is to amend its unsettled policy in railway finance, establish a fixed and definite policy which will not be subject to modification for at least six or seven years, and raise a foreign loan to make good the deficit left after the profits have been set off against the requirements of the programme. From this the *Asahi* infers that the Government has decided to modify existing railway schemes and to raise a foreign loan for carrying out the new scheme. The annual expenditure for the improvement of the existing railway lines, it states, will be about Y40,000,000, which is the maximum limit of the work the railway authorities are capable of carrying out.

The *Osaka Mainichi* quotes Baron Takahashi, Minister for Finance, as follows on this question: "The management of the railway accounts has aroused a great deal of public attention, and different questions have been raised in connection with the general financial scheme. Railway profits being insufficient to meet the requirements for improvement and new construction, Y21,500,000 was drawn for this purpose for the present year from the Deposits Bureau. At the present rate of increase in Post Office savings, it is doubtful whether the money can be borrowed from the Deposits Bureau next year as it has been this year. The improvement and construction of railways is indispensable for developing industry, so the work cannot be delayed even temporarily. Viewed in the light of the principle on which the railway accounts have been kept separate from the general accounts, it is only proper to have recourse to a loan for raising money for railway works, and there is no reason why bonds should not be issued at an opportune time. I am not in a position as yet to make any statement regarding the business of Mr. Mori, financial agent of the Government in Europe, who is leaving Tokyo for London by the end of the month."

Nankai Railway Co.—The profit and loss accounts of the Nankai Railway Company for the half-year just closed put the gross revenue at Y810,085 and expenditure at Y420,473, leaving a net profit of Y387,612, which comes up to Y555,665 with the surplus brought over. This sum it is proposed to dispose of as follows:—

Legal reserve	Y19,400
Bonuses to the officials	9,500
Dividend, 8½ per cent. per annum	311,732
Carried forward	215,033

Narita Railway Co—This Company at its semi-annual general meeting adopted the statement of accounts together with the following proposal for the disposal of the profits:—

	Yen.
Net profits	115,299.53
Brought over from last account	6,155.75
Total	121,455.29
Legal reserve	6,500.00
Secondary reserve	11,500.00
Bonuses for directors and auditors	11,000.00
Dividend at 7 per cent.	84,875.00
Carried forward to next account	7,580.29

Japanese Railway Returns.—According to official investigations satisfactory results attended the business of the Japanese Government Railway Board during September last. The receipts from passenger traffic for the month amounted to 4,903,753 *yen* and those from freight to 4,578,539 *yen*, thus bringing the gross income up to 9,482,292 *yen*. As compared with the same period of last year this is an improvement by 846,033 *yen*.

New Light Railways.—The Government has granted charters to the Ishikari Colliery Company and the Okayama Light Railway Company for laying railways 5.64 miles and 4.40 miles in length. The capital of the former Company is 394,000 *yen* and of the latter 182,000 *yen*.

The Railway Board has granted a charter to the Iwamatsu Light Railway Company, promoted by Mr. Den Honda, for laying a light railway between Iwamatsu village and Takachika, in Kita Uwa district, Ehime prefecture. The length of the railway will be 1 mile 60 chains with a gauge of 2 feet 6 inches. The capital of the company will be 69,500 *yen*.

The Railway Board has granted a charter to the Nakazeki Light Railway Company for the construction of a line between Bofu and Nakazeki, in Sawa district, Yamaguchi prefecture. The length of the railway will be four miles eight chains with a gauge of 2 feet 6 inches. The Nakazeki Light Railway Company is promoted by Mr. Benji Kato and 24 others with a capital of 150,000 *yen*.

The Railway Board has also given a charter to the Takata Railway Company for laying a light railway connecting Chosu, Usa district, with Takata, Nishi Kokuto district, in Oita prefecture. The length of the railway will be 3 miles 40 chains with a gauge of 2 feet 6 inches. The Takata Railway Company is promoted by Mr. Chuzo Eto and 21 others with a capital of 110,000 *yen*.

The Bisai Railway Company has obtained a charter for laying railways between Nanatori and Tado in Kuwana district, Mie prefecture and between Tsushima and Tatsuda in Umibe district, Aichi prefecture. The length of both railways will be 4 miles and 73 chains with a gauge of 3 feet 6 inches. The cost of construction of the two lines is estimated at 220,000 *yen*.

MANCHURIA

Kirin-Changchun Railway.—The repairs on the Kirin-Changchun Railway having been quite finished, the train service, which has been operated only once daily from each terminus since last summer's inundation was to be restored to twice daily from November 15, by running a mixed passenger and goods train.

South Manchuria Railway.—During the month of October the S. M. Railway earned Y1,990,616, being an increase by Y639,822 over the corresponding month of last year. This gives a daily average of Y64,213. The aggregate receipts since last April reach Y11,132,006, which is an increase by Y2,736,568 over the corresponding period of last year.

The South Manchuria Railway Co.'s estimates of capital expenditure for investment in the next fiscal year, as roughly outlined by the Company's Directorate, are said to reach Y13,400,000, as against Y14,200,000 for the present fiscal year.

Kirin-Hoiryong Railway.—The Department of Foreign Affairs of the Chinese Republic, recognizing the necessity of a speedy completion of the Kirin-Hoiryong Railway, to connect Kirin, Hoiryong and Northern Chosen, has decided to despatch a number of surveyors to the territory, says a Tokyo paper.

The railway is to be built from Kirin, *via* Omoso, entering Chientao and passing through Chutszchieh, the principal town of Chientao, to Hoiryong, a distance of about 200 miles. The estimated cost of the railway is 40,000,000 yen. When the line is completed, connections will be made with the Seoul-Wonsan line, now under construction, and the Eastern Chosen coast line and Kyongsong line, to be laid in the near future. This will not only contribute to the development of commerce between China, Manchuria and Japan, but will promote a better feeling between Japanese and Chinese. The conditions under which the line are to be built are similar to those in regard to the Kirin-Changchun line.

TIENTSIN-PUKOW RAILWAY

(SOUTHERN SECTION)

Owing to the fact that the southern section of the Tientsin-Pukow line has been treated as a line under construction up to June 30th last open line accounts were not maintained, and it is impossible therefore to give a full report of operations. However, by the courtesy of the authorities we are enabled to reproduce interesting extracts of the coaching and traffic receipts for 1912.

GOODS TRAFFIC FOR 1912

Previous Year Weight Pcls.	Previous Year Amount $	c.		Current Year Weight Pcls.	Current Year Amount $	c.
—	—	—	I.—General Merchandise	3,996,398	856,730	09
—	—	—	II.—Government Stores	131,327	10,833	78
			III.—Railway material for construction	—	—	—
—	—	—		4,127,725	867,563	87
			IV.—Coal			
—	—	—	(a) For the public	6,298	433	35
—	—	—	(b) For Loco. Dept. (Revenue only)	—	—	—
—	—	—	(c) For other Railway Services	—	—	—
—	—	—	Total Coal ...	6,298	433	35
—	—	—	V.—Revenue Stores for all Depts., excepting coal	—	—	—
—	—	—	Total Goods ...	4,134,023	867,997	22
No.				No.		
			VI.—Livestock (Ordinary)			
—	—	—	(a) Horses, cattle, etc.	182	312	81
—	—	—	(b) Sheep, goats, pigs, etc.	65	13	10
—	—	—	Total	247	326	91
			VII.—Livestock (Government)			
—	—	—	(a) Horses, cattle, etc.	282	889	90
—	—	—	(b) Sheep, goats, pigs, etc.	—	—	—
—	—	—	Total	282	889	90
—	—	—	VIII.—Rents, demurrage, wharfage, storage, etc.	—	500	00
—	—	—	IX.—Miscellaneous	—	10,921	53
—	—	—	Total	—	11,421	53

N.B.—16-80 piculs are taken as the equivalent of a ton.

COACHING TRAFFIC FOR 1912

Previous Year Total No	Previous Year Total Amount $ c.	Single fare per mile ...	First Class about 6 4/10 cents No.	Amount $	c.	Second Class about 3 6/10 cents No.	Amount $	c.	Third Class about 2 8/10 cents No.	Amount $	c.	Current Year Total No.	Amount $	c.
		I.—Passengers:—												
		(a) Ordinary... ...	833½	13,631	320	1,691	11,173	315	502,592	449,414	220	505,116½	474,218	855
—Nil—		(b) Government ...	240	1,436	840	839	2,853	420	98,588	30,973	570	99,667	35,263	830
		(c) Season	—	—	—	—	—	—	—	—	—	—	—	—
		(d) Privilege... ...	—	—	—	8	13	130	20,628	9,557	697	20,636	9,570	827
		(e) Excursion ...	6	100	240	9	131	120	130	67	883	145	299	243
		Total	1,079½	15,168	400	2,547	14,170	985	621,938	490,013	370	625,564½	519,352	755
—Nil—		Excess Fares	—	437	053	—	358	155	—	14,406	667	—	15,201	875
		Sleeping Berths ...	160	800	000	—	—	—	—	—	—	160	800	000
		Total	1,239½	16,405	453	2,547	14,529	140	621,938	504,420	037	625,724½	535,354	630
		Previous Year... ...												

Previous Year			No.	Amount $	c.
	II.—Passengers' Luggage	Piculs	108,939.89	12,248	510
—Nil—	III.—Government Baggage	„	205.74	522	500
	IV.—Parcels:—				
	(a) For the Public	„	35,500.84	10,612	560
	(b) For Revenue	„	—	—	—
	V.—Horses, Carriages, Dogs, etc. (Ordinary)	No.	1,306	2,764	010
	VI.—Horses, Carriages, Dogs, etc. (Government)	„	480	719	110
	VII.—Special Trains	Train Miles	295	979	000
	VIII.—Trollies	Trolly Miles	—	—	—
	IX.—Miscellaneous			352	561
	X.—Post Office			—	—
—Nil—	Total	Total ...		563,552	881

N.B.—1.—The Excess fares have been divided up between I, II and III class in the same proportion as the actual "ordinary" traffic for these classes.

2.—Total amount for Telegraph Earnings for the year is $10,795.67 (Chinese Telegraph Administration Charges $2,937.91 and Northern Section Shares $239.45 are included).

3.—Total amount for Sundries (Rents of Refreshment rooms and cars and Miscellaneous only, for the year is $1,139.01.

TRAMWAYS

Hongkong Tramway Co., Ltd.—The Board of Directors of this Company has declared a dividend at the rate of 5 per cent. per annum for the half-year ended June 30 which was to be paid on and after October 29.

Shanghai Tramways.—The following is the traffic return of the Shanghai Tramways (Foreign Settlement) for the month of October, 1913, and for ten months ended October 31, 1913, with figures for corresponding periods last year:—

	1913. $	1912. $
Effective receipts	87,270.35	73,161.33
Passengers carried	4,675,579	3,803,578
Car miles run	259,263	237,179
Loss by depreciation of subsidiary coinage	24,957.43	21,168.20
Percentage of loss by depreciation of subsidiary coinage	23.35	23.79

	10 months ended Oct. 31, 1913 $	10 months ended Oct. 31, 1912. $
Effective receipts	763,113.24	662,036.40
Passengers carried	39,419,500	33,872,378
Car miles run	2,386,227	2,295,535
Loss by depreciation of subsidiary coinage	214,750.69	201,940.61
Percentage of loss by depreciation of subsidiary coinage	23.19	24.85

Week ended October 22.

	1913. $	1912. $
Effective receipts (after deducting loss by depreciation of subsidiary coinage)	19,583.36	16,153.84
Passengers carried	1,042,087	831,881
Car miles run	58,437	53,408

The loss by depreciation of subsidiary coinage for the week was $5,563.64, equal to 23.26 per cent. of the gross cash collected on the cars as compared with $4,630.95, equal to 23.69 per cent. for the corresponding week last year.

Week ended October 29.

	1913. $	1912. $
Effective receipts (after deducting loss by depreciation of subsidiary coinage)	18,967.55	15,947.43
Passengers carried	1,009,929	823,344
Car miles run	57,843	52,416

The loss by depreciation of subsidiary coinage for the week was $5,338.99, equal to 23.12 per cent. of the gross cash collected on the cars as compared with $4,538.32, equal to 23.57 per cent. for the corresponding week last year.

Week ended November 5.

	1913. $	1912. $
Effective receipts (after deducting loss by depreciation of subsidiary coinage)	18,634.01	16,717.79
Passengers carried	988,211	859,313
Car miles run	57,055	52,702

The loss by depreciation of subsidiary coinage for the week was $5,248.22, equal to 23.13 per cent. of the gross cash collected on the cars as compared with $4,784.68, equal to 23.57 per cent. for the corresponding week last year.

Week ended November 12.

	1913. $	1912. $
Effective receipts (after deducting loss by depreciation of subsidiary coinage)	19,168.95	15,457.98
Passengers carried	1,003,493	784,669
Car miles run	58,823	51,127

The loss by depreciation of subsidiary coinage for the week was $5,181.66, equal to 22.41 per cent. of the gross cash collected on the cars as compared with $4,352.35, equal to 23.39 per cent. for the corresponding week last year.

The Dairen Tramway.—The *Manchuria Daily News* learns that the South Manchuria Railway proposes to construct a tramway between East Circle (at the entrance to Dairen Wharf compound) and Jijiko (East End), where the officials and employees on the Railway Wharf staff have their quarters.

The terminus of the Hoshigaura suburban line will be shifted westward to the Hoshigaura Restaurant.

An appropriation of about Y30,000 has been included in the estimates for the next fiscal year for these purposes.

Mino Electric Tramway Co.—The gross profit of the electric car department of the Mino Electric Tramway Company for the last half-year has amounted to Y137,998, and that of the land department to Y41,224, making a total of Y179,223. Of this sum Y17,644 is to be deducted for the reserve for laying out of gardens, etc., Y21,958 the reserve for the fund required for making works for supplying electric current to the Osaka Electric Tramway Company, and Y1,447 for reserve against depreciation of buildings, leaving a balance (net profit) of Y138,172, which will bring up the total to Y313,917, including the surplus brought over. This sum is proposed to be disposed of as follows:—

Reserve	Y 8,000
Dividend, 7 per cent. per an...	115,500
Bonuses to the officials	6,500
Carried forward	183,917

Keihan Electric Tramway Co.—The gross earnings of this Company for the last half-year ending September amounted to Y695,915, and working expenses to Y323,046 leaving a balance of Y372,869. This, added to the surplus brought over, makes a total of Y409,450, which it is proposed to dispose of as follows:—

Legal reserve	Y1,900
Reserve for pension fund of employés	2,000
Bonuses to officials	10,000
Dividend, 6½ per cent. per annum	341,250
Carried forward	37,200

Japanese Railless Trams.—The Railless Electric Tramway Company promoted by Baron Go, Mr. Toyama, Mr. Kume, Mr. Arai, Mr. Shirai, Mr. Sugawara, and other noted business men is reported to have sent in an application to the Government for permission to start business. It is proposed to run railless electric cars in Tokyo, Yokohama, Shidzuoka, Nagoya, Utsunomiya, and Sendai with a capital of 3,000,000 *yen.*

MINING

Tungsten Ore in Burma.—Mr. H. B. Osborne, U. S. Vice-Consul at Rangoon, reports that ores of tungsten and tin have been discovered practically all over the Tavoy and Mergui districts, and a large number of concessions are being worked. Wolframite is the main object of exploitation, cassiterite being a sort of by-product, although at times the tin ore forms a larger percentage of the alluvial deposits than the wolframite.

It is practically impossible at this stage of development to give any figures showing what percentage of wolframite or cassiterite occurs in the lodes, as very little lode mining has been done, but judging from the abundant alluvial deposits scattered over the hillsides near the lodes and by the appearance of the lodes themselves there is ample justification for prospecting some of the lodes by adits. It is said that work of this nature is being carried out on several concessions.

The greater part of the output of wolframite from the Tavoy district is obtained from the float deposits. The extent of float areas cannot at present be even estimated, but judging merely from the topographical features of the country in which they occur they are of varying and often considerable extent and will yield ore in paying quantities for a long time to come. They are being exploited on the contract system, a miner being paid a certain fixed sum per agreed weight. The concentrates resulting from this class of work are very rich and sell well. The percentage of tin in the alluvial ground very often becomes an important factor, notwithstanding the fact that it occurs in practically negligible quantities in the lodes.

As mining in Tavoy is in its infancy, statistics of actual mining work cannot be given, but it appears that the laborers are continuously improving in efficiency. The natives work the deposits with pan, sluice box, and rocker, and earn up to 48 cents per day.

Following is an estimate of the cost of a 68 per cent. wolfram ore from float workings about 20 miles from Tavoy, transportation being by road and river: Average contract price of labor for collecting a ton of ore, $129.77; average transport cost to Java, $5.03; transport to wharf, $0.65; ore bags and bagging, $4.86; royalty to Government, $11.03; customs freight to Rangoon, $2.41; tools and stores, $4.38; traveling expenses of staff, $9.89; general Tavoy expenses, $15.98; Indian supervision, $9.73; European supervision, $103.81; freight to England, storage, and assay charges, $16.22. The total cost, therefore, delivered in England, is $313.76. When the ore is selling at $7.30 per unit (1 per cent. content of tungsten trioxide) the profit on a ton of 68 per cent. wolframite is over $180. The average concentrates from the float workings contain about 65 per cent. of WO_3.

No doubt a great many improvements can be introduced for exploiting the float areas, notably hydraulic mining with power pumps, but so long as the extent of such areas remains unknown and so long as the crude methods of obtaining the ore leave a large margin of profit, up-to-date methods will not be tried.

Hokkaido Alluvial Gold.—Esachi in Katami province in the Hokkaido, once famous for its production of alluvial gold and called the Klondyke of the Orient, is not now so prosperous as it was in former times.

The districts in which this alluvial gold is found are the villages of Usotan, Pankenai, and Bechan, and the rivers and seashore round about them. Over 300 people annually engage in "panning" the sands of these rivers and shores, and this year the expected production will be over 13 *kwan*, valued at 4.50 *yen* per *momme*. The work commences in May and continues till October, September being usually the most prosperous month.

Living expenses in this district are about 40 *sen* a day and the daily income of one person engaged in "panning" is estimated at from 1 to 3 *yen*.

In the early days over 10,000 persons were annually engaged in seeking the gold from the sands about these towns, and even to-day when the deposits have almost given out the speculative spirit is still rife among the village people and hundreds of them constantly apply for permission to seek their fortunes in these sands.

Coal Mine on Saghalien.—A discovery on Saghalien of a coal mine of immense capacity was made by a fisherman some time ago, and is now confirmed by Mr. Kaga, a civil engineer, who was sent by the Department of Agriculture and Commerce to the scene of the discovery and made a thorough investigation.

The mine stands two miles above a tributary of the Santan River, on the western shore of the Island. An exposed part of the mine can be seen about two hundred yards from the sea shore, extending about 600 *ken* in width and about 800 to 1,000 *ken* in length. It is calculated that the part above ground has coal to last 250 years, and, with what lies beneath the ground, will bring an additional wealth of 400,000,000 *yen* to Japan. The quality of the coal is second to the Fushun coal.

The cost of marketing is believed to be far less than the average. As it is close to the sea-shore, and surrounded by dense forest, the

loading and supply of fuel will be greatly facilitated. It is estimated that when the coal is sent to Yokohama it will cost about 3.40 *yen* a ton, whereas other coals delivered at Yokohama cost 6 *yen* or more.

The coal can also find a market in the territory along the Amur River and the neighbourhood, and can easily compete with Hokkaido coal. The sea freezes in the winter necessitating the suspension of shipping, but this is more than counter-balanced by the facility for storing the product and shipping it in large quantities when winter is over.

Dredging in Malaya.—We are informed that owing to the successful result obtained with dredgers Nos. 4 and 5, constructed by Messrs. Wm. Simons & Co., Ltd., the Tongkah Harbour and Tin Dredging Co. has just placed an order with the same builders for another dredger of somewhat similar type, but more powerful. This dredger is the fourth vessel which Messrs. Simons have been commissioned to build for the Tongkah Company.

Kailan Mining Administration.—The total output of the Administration's mines for the week ended October 11, amounted to 41,817.76 tons and the sales during the same period, to 46,605.09 tons.

Week ended October 18, output 42,446.26 tons, sales 38,399.10 tons.

Week ended October 25, output 45,556.14 tons, sales 43,138.76 tons.

Week ended November 1, output 48,662.18 tons, sales 38,146.85 tons.

SUGAR

The Market in Japan.—The output of Formosan sugar in the present season, says the *Asahi*, has been finally estimated at about 2,700,000 piculs and the associated crude-sugar producers in Formosa have been holding conferences to consider the opening quotation for the new season sugar. Owing to the different interest of each company in the association, no decision has been yet arrived at. The sugar market in Japan and abroad has been steadily advancing lately, and report after report has been bringing good news to the sugar companies in Formosa. According to the latest telegraphic advices, continues the journal, the total shipments of Java sugar, so far contracted for, amount to 800,000 tons, and the stock left in Java is not more than 600,000 tons, the greater part being white *zarame*, with a small percentage of yellow *zarame*. This shows that the stock of sugar in Java to be carried over to next year cannot be considered very large. It is for this reason that quotations advance with the receipt of every new advice. Sugar for December shipment is now quoted at Y7.20 per picul, and for January and February shipment at Y7.30. The rates mean an advance of about 50 sen over the low rates which prevailed recently. When the import duty and excise amounting to Y8.10 are added, the price in Japan will be Y15.30 or so.

The large imports of Java sugar resulted in an over-supply, and dealers were placed in a very awkward position until the increased export this year relieved them from their difficulty. About 4,500 tons were transferred for refining purposes, and when two or three thousand tons more are similarly disposed of, no stocks will be left to be carried forward to next year.

FINANCIAL

Japan's Foreign Trade.—According to a statement published by the Japanese Finance Department Japan's foreign trade during the last ten years has shown an excess of imports over exports, except in 1906 and 1909, when the balance of trade stood in favour of the exports by 4,970,784 *yen* and 18,913,668 *yen* respectively. The following figures show the balance of trade during the last ten years, the amounts marked with an asterisk being excess of exports and all the others excess of imports:—

	Yen
1902...	13,428,194
1903...	27,633,076
1904...	52,099,844
1905...	167,004,407
1906...	4,970,784*
1907...	62,054,473
1908...	58,011,789
1909...	18,913,668*
1910...	5,804,812
1911...	66,371,817
1912...	92,010,435

Industrial Loan for China.—A Peking telegram, dated November 4th, states that the Government has concluded a loan with the Banque Industrielle in Peking. The amount of the loan is £6,000,000 and the money is solely for industrial purposes.

Japanese Domestic Loans.—Negotiations for the issue of company debentures or municipal loans, which had been hung up on account of the general tension in the money market, were renewed last month as a result of the temporary relief of the market owing to the diminished demand for money. According to the *Osaka Mainichi*, negotiations for the issue of debentures for the undermentioned concerns were brought to a successful conclusion in October.

	Interest Per cent.	Amount	Issue Price.
Nippon Kogyo ...	9	Y900,000	Par
Toyo Kisen ...	8	2,000,000	Y98
Kyoto Municipality	6	1,200,000	93
Hokkaido Colonial Bank...	6½	2,000,000	93
Kyoto Electric Light	7½	700,000	96
Ujikawa Electric Co.	sen 1.4 (daily)	480,000	—

Kobe Waterworks Loan.—The proposed issue of the Kobe waterworks bonds for Y1,200,000 for the extension of the waterworks, which at one time was considered hopeless, still seems unlikely to be effected just yet, says the *Japan Chronicle*. Negotiations had been progressing favourably with the Mitsui Bank for Y700,000 on comparatively favourable terms, but a Kyoto municipal loan just negotiated at high interest has affected the negotiations for the Kobe loan. Now no banker is willing to undertake the issue at interest lower than 6 per cent. or with the amount receivable by the Municipality at more than Y92 per Y100 face value.

China Export and Import Bank Co.—An insight into the economic position in both Japan and China is afforded by the report of the China Export-Import and Bank-Compagnie zu Hamburg for 1912, says The *Japan Chronicle*. This is a Hamburg company of merchant bankers who have branches at Hongkong, Shanghai, Kobe, and Yokohama. The Japanese branches failed to yield all the results expected. "We failed to get the opportunity," says the report, "to lay out any large sums of capital with safety and profit. Competition grew in keenness, and the facilities offered and actually granted to customers at starvation rates left us often no other alternative but to play the part of onlookers. Like everything else in Japan, commercial interchange is being improved and perfected, and the merchant class, which was formerly looked at askance, is gradually developing into a power which will make itself felt in the near future. Here we see the methodical purpose and self-confidence of the Japanese, with their hopeful expectation of a better future and their sober determination to starve themselves into greatness. The financial position has again improved slowly, but surely. . . . Without shrinking from the cost or making much ado about it, Japan is bowing to the necessity of maintaining its land and sea defences on the highest possible level and of keeping its powder dry."

With regard to China, its revolutionary leaders, its mercantile classes, its present rulers and its economic prospects, the report rising quite above the ordinary sordid money-making level, speaks in a tone of high enthusiasm:—"The leaders of the new movement, acting and working without regard to self, demanded with inflexible will protection for life and property, for trade and industry, and the obedience yielded to this demand honored both officers and privates in the ranks of the soldiery. The highest praise and every recognition to the inhabitants of such a country! . . Confidence unfortunately was wanting and is still wanting to-day (this was dated 7th May last) in the capacity of the Government to introduce and maintain a well-ordered and solid finance reform. The peasant shrinks from acknowledging the possession of money preferring in old fashioned style to shield his well-filled stocking from the curious gaze of neighbors or the Government by a covering of earth. Consequently the bank facilities, which once flowed so copiously and smoothly, have failed up to the present moment, and the possibility of preserving freedom from foreign influences by internal loans and increased taxation has also failed. . . . During the year the Chinese merchants have earned abundant profits on the money, the talent and the spirit of enterprise which they have invested in their work. . . . . Strong united action was inaugurated between China and Japan, and this fact grew in popularity in both countries. A union between these two Powers will be for both a source of wealth and peace and unsuspected development of power."

The Bank may be congratulated on having done superlatively well during this transition period. Its capital consists of no more than 1,000,000 mark, with a reserve fund 10 per cent., of that amount, yet its net profits amounted to 2,342,068 mark, out of which it was able to distribute a dividend of 4 per cent. (60,000 mark) and a super-dividend of 112 per cent. (1,680,900 mark). We can understand the Board's enthusiasm over the trend of events in China and Japan. If such things are done in the green tree what will be done in the dry?

LIGHT AND POWER

Inawashiro Water Power Co.—This Company held its general meeting recently when the business report for the term ending September 30th last was laid before the meeting, together with the statement of accounts. These showed that the receipts for the period amounted to 69,481.84 *yen*, which with the sum of 61,768.16 *yen* brought over from last account made a total of 131,250 *yen*.

It was decided to pay a dividend of 5 per cent.

SHIPBUILDING

Taikoo Dockyard & Engineering Co.—On November 11 the Taikoo Dockyard and Engineering Co. launched the steel screw steamer Medusa, which has been built to the order of Messrs. Alfred Holt and Co., for their Singapore and Deli trade. The vessel is of the awning deck type, the principal dimensions being as follows:—

Length over-all	204'0".
Breadth	31'6".
Depth to awning deck	21'6".
Tonnage, gross...	About 800.

Accommodation for passengers is fitted up amidships, with dining saloon. The officers' and engineers' rooms are situated aft in a steel house on the awning deck, the crew being berthed forward and the petty officers aft. The 'tween decks are arrangel for carrying steerage passengers, and open spaces are fitted up for the carriage of cattle. Electric light will be fitted throughout. Triple-expansion engines of the builders' own make are being installed, steam being supplied from a large single-ended boiler. The vessel is expected to develop a speed of 12 knots.

Hongkong and Whampoa Dock Co.—On October 30 a new steamer, the *Jade*, built for Mr. P. Roque at the Kowloon Dock, was successfully launched by Mdlle. J. Liebert, daughter of the French Consul in Hongkong. This is the sixth vessel built for Mr. Roque by the Dock Company, and it will engage in the trade on the coast of Tonquin and North Annam, mostly between Haiphong and Vinh.

The *Jade* is a steel single-screw steamer of the following dimensions:—Length overall, 166ft. 6in.; length between perpendiculars, 153ft.; breadth, extreme, 28ft. 8in.; breadth moulded, 27ft. 3in.; depth moulded, 17ft. 11in. She is built to the rules and requirements of Bureau Veritas highest class special survey, with fixed free-board, having two decks sheathed with teak. The engine and boiler space is amidships, providing two large cargo holds. Water ballast is carried in the fore and after peaks. Spacious 'tween decks are served by four large watertight doors. The cargo hatches, 20 feet long by 10ft. 6in. wide and 16 feet by 10ft. 6in., are efficiently protected by hardwood sheathing, protection which the owners found necessary during their long experience in the special trade for which the vessel is designed. Powerful steam winches of the friction type by Messrs. Stapfer du Clos are fitted on the main deck, working cargo from steel derricks. The mast are specially strengthened, a strong hook being fitted on the main mast for towing lighters. The steam windlass is by Messrs. Clarke, Chapman & Co., Ltd. State-rooms are provided for six first-class passengers. The Captain's accommodation is on the boat deck. The vessel is fitted throughout electric light by Messrs. W. C. Jack & Co., Hongkong, under whose superintendance the design and construction of the vessel have been carried out.

The propelling machinery consists of a set of triple expansion engines driving through steel shafting a bronze propeller. The engines are very substantially built throughout. Steam is generated in a large single-ended boiler, working under natural draught, and designed for a working pressure of 180 lbs. per square inch. The machinery throughout has been designed and constructed to the requirements of the Bureau Veritas.

Light Draft Motor Boats.—Messrs. W. S. Bailey & Co., Ltd., of Kowloon, have handed over to the Standard Oil Co., of New York, the second of two light-draft motor boats designed for service as inspection boats for the Company's increasing business above Canton. The vessels, named respectively *Wah Mee* and *Cheung Mee*, are of the house-boat type and each 12 feet in length. There is a short deck space forward for handling the anchors and similar deck room aft for accommodation of water tanks and crew's galley, etc., the space between being occupied by the housing with ample head room and comprising motor room, large saloon, bath room and European galley. The steering gear and oil tanks are fitted upon the upper deck.

The motors are of the 30-horse-power Kelvin type starting on petrol and working with kerosene, and driving the vessels at 7 knots per hour on four continuous measured mile trials. The vessels have a mean draft of 1ft. 3ins. only.

Messrs. Bailey & Co. have already built forty motor yachts, house-boats and cabin cruisers, both twin and single screw, of length from 16ft. to 70ft, and from 3 h.p. to 100 h.p., many of the boats being shipped on steamers' deck to Vancouver, Java and elsewhere.

The motors fitted in these vessels include the Kelvin, Fay & Bowen, Djinn, Forth, Gardner, Gray, Atlas, Speedway, Lowe Victor, Fairbanks Morse, Standard Thorneycroft, Otto, Martini and Daimler, and the Company are steadily improving their designs for such vessels in regard to speed and draft, quality of work and quickness of outturn.

The vessels now building in the Company's yard include a 45-feet motor-boat, a 79-feet steam tug, two 90-feet steel oil barges of 150 tons capacity and a steel cargo steamer for the Manila lumber trade. The latter vessel is 191 feet in length by 30ft. 6ins. beam and 15ft. 5ins. deep. She will carry 1,000 tons dead weight, be built to Lloyd's highest class, and have four derricks with winches each capable of lifting six tons. The engines are triple expansion of 700 horse-power, supplied with steam from a boiler 14ft. 6ins. diameter at a working pressure of 180 lbs. per square inch.

The Company have also in hand steel wharves in Canton for the Chinese Imperial Maritime Customs and for the Hongkong, Canton and Macao Steamboat Co., and in Amoy for the Standard Oil Co., besides general repair and sundry work.

PERSONAL

Mr. T. Rasschou, Danish Consul-General, has returned to Shanghai and taken charge of the affairs of the Consulate.

Mr. George Richard Wingrove has been gazetted as qualified Auditor under Section 16 of the Hongkong Companies Amendment Ordinance of 1913.

Mr. Mortimer L. Stewart, Director of the Bureau of Prisons in the Philippines, has been appointed Managing Editor of the *Manila Daily Bulletin* in succession to the late Mr. William Crozier.

Mr. G. Muller, Professor of German in the Customs College, has been transferred to Shanghai.

Mr. E. T. C. Werner, British Consul at Foochow, has been granted home furlough and will leave for Europe at the end of December. Mr. F. E. Wilkinson has been appointed Officiating Consul at Foochow.

Mr. Charles Addis, London Manager of the Hongkong and Shanghai Banking Corporation, has had conferred upon him the honour of knighthood.

The Chiaho Decoration has been conferred upon Mr. H. E. Fulford, British Consul-General at Shanghai; Mr. G. Kahn French Consul-General at Shanghai; Colonel C. D. Bruce, Police Adviser; Mr. F. S. Unwin, Commissioner of Customs at Shanghai; Mr. R. B. Mauchan, Superintendent-Engineer of the Kiangnan Dock and Engineering Works, and Captain Rabier, of the French Minicipal Council at Shanghai.

Consul-General Thomas Sammons of Yokohama is to succeed Dr. Wilder as Consul-General for the United States at Shanghai.

Mr. W. G. Calhoun, formerly United States Minister to Peking, has been granted the Order of the Chiao, First Class, while the Second Class of the same order has been given to Freiherr von Maltzan, German Councillor of Embassy.

The Chiao-ho Decoration of the 2nd class and the Tiger Decoration of the same class have been conferred by President Yuan Shih-kai upon Privy Councillor Wentzel, Chief Engineer of the Chinese-Eastern Railway, and Major-General Horvat, respectively.

Doctor Bernard Herstein, the famous tariff expert, has accepted the position of collector of customs for the Philippine islands. He was to sail from the United States on November 11 and reach Manila during the early part of December.

Mr. T. H. U. Aldridge, the Municipal Electrical Engineer, has returned to Shanghai from Europe.

The names of Messrs. G. H. Thomson, N. Thomson, C. H. Bell, and G. B. George appear as qualified auditors under Section 16 of the Hongkong Companies Amendment Ordinance of 1913.

Mr. Steele, the assistant traffic manager of the Peking-Moukden railway, has just returned from his trip home.

Lieutenant H. von Heidenstam, Chief Engineer to the Huangpu Conservancy Board, has returned to Shanghai from Europe.

A Peking telegram dated November 6 states that Dr. Henry C. Adams, Adviser to the Commission on the Unification of Railway Accounts and Statistics, together with Dr. Ching Chung-wang and Mr. K. S. Tseng, have arrived in the Capital.

Dr. Adams has been for many years the Expert Statistician and Accountant of the Interstate Commerce Commission, which has control of the American railways. The unification of railway accounts and statistics, which has been brought about during the last fifteen years, has been largely due to the efforts and guidance of Dr. Adams.

Before his connection with the Interestate Commence Commission, Dr. Adams was connected with the Pennsylvania Railroad in the reorganization of accounts and finance. Dr. Adams comes to China for one year, having been given leave of absence by the Interstate Commerce Commission, during which time, he still acts as adviser in absentia to that commission.

HANYANG PIG IRON

The proposed placing of pig iron on the free list, says the American *Engineering and Mining Journal*, has brought one of the Pennsylvania Senators to the front with doleful anticipations of the closing of our merchant furnaces by the rush of imports from China. His figures as to wages and other costs in that country make a striking contrast to those of the Pennsylvania iron makers, but when we come down to actual facts, the prospects of any real competition seem sufficiently remote.

China has certainly large resources in iron ore and coal, but their development so far has been exceedingly slow and does not seem to increase. The largest iron works in China are those at Hanyang, and in this country the plant would rank as a small one; moreover its total production is far below the consumption in this country. What foreign trade it has is chiefly with Japan, and that country takes more iron ore than pig or finished ore, preferring to do the smelting in its own furnaces

One attempt was made on the Pacific Coast to import Chinese pig iron regularly under contract, but that resulted in a rather disastrous failure. The exports of iron ore from China reached their highest figure in 1911, with 68,630 tons, but in 1912 fell to a little less than 8,000 tons. In both years little or none of the exported iron went farther than Japan. Even if it had all come to this country the quantity would have been less than .002 per cent. of our consumption. We are not advocating free pig iron, but its opponents to secure success, must find some better argument than Chinese competition. The awakening of industrial China is slow and must be slow, in the nature of things. Forty or fifty years from now iron from the East may be a factor in our industrial situation, and then it may be time to protect ourselves. At the present time, however, it seems simply a waste of time to to talk about it.

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THE FAR EASTERN REVIEW

COMMERCE :-: ENGINEERING :-: FINANCE

VOL. X. SHANGHAI AND MANILA, DECEMBER 1913 No. 7

THE HAI-HO CONSERVANCY

HISTORICAL SKETCH OF THE EFFORTS AND WORK ENTAILED IN PLACING TIENTSIN WITHIN REACH OF SEA-GOING STEAMERS

Unquestionably the condition of the Hai-Ho—the watercourse between Tientsin and the sea—has throughout the past 15 years stood unrivalled in importance among the matters most vitally affecing the commercial and general welfare of Tientsin. That the state of the river has at times seriously militated against the port's trade, and that in the satisfactory solution of this problem is wrapped up the future preservation of the port's position of commercial pre-eminence in North China, have become axioms upon the tongues of those whose interests are at stake. To cast up in sharp outline a picture of the conditions that prevailed before any remedial measures were undertaken, and to form a basis for a more intelligible understanding of the problem, it is worth while glancing rapidly over the periodical Reports upon this bête noire for several preceding years.

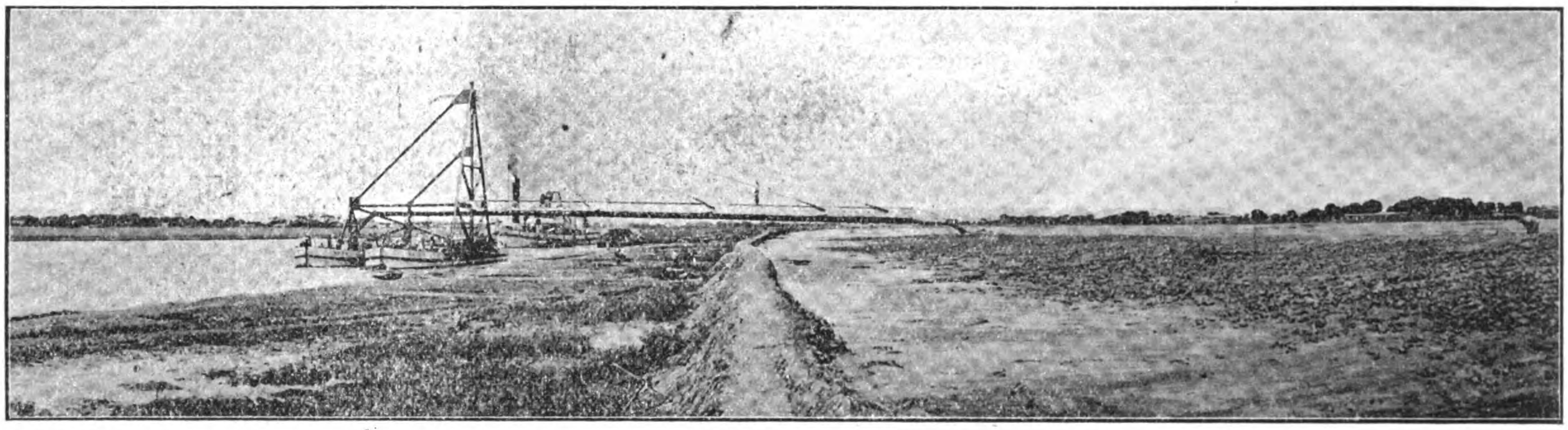
As far back as 1886, we find that up to the 27th March there was sufficient water in the river for all vessels to come up to the Tzu-chu-lin (紫竹林) anchorage—or to the Bund, in other words,—but that after that date the river commenced shoaling, and all but vessels of the lightest draught were compelled to discharge their cargoes at some distance below the Settlement. This state of things continued until the middle of September, when the bed of the river again deepened and the community had once more the satisfaction of seeing an imposing line of steamers moored to the Bund.

During the summer of 1889 the Hai-Ho was said to be more difficult to navigate than during any season since the port had been opened. By the 12th July all attempts to reach Tientsin were given up, and a temporary anchorage was established at Pait'ang-k'ou (白塘口), 14 miles below the Bund, where until late in October all steamers discharged and loaded.

Throughout the earlier "nineties" constant references are found in the annual Trade Reports to the increase in the port's business in spite of the handicap imposed by the river, among them the following, for 1895:—"The Pei-Ho, our chronic local trouble, behaved moderately well, although during the months of July, August, and September steamers were compelled to lighter a good deal of their cargo and for some weeks could not navigate the upper reaches."

The following year—1896—was one of the worst in the history of the port. For more than seven months steamers were unable to reach the Bund, and the outlook was so serious that not only Foreigners, but even Chinese, began to take alarm. The Tientsin Chamber of Commerce then entrusted Mr. A. de Linde, who afterwards became prominent in Hai-Ho conservancy matters, with the task of making a survey on which to base plans for amelioration.

A repetition of the evil occurred in 1897, when for over six months the depth of water ranged between 5 and 8 feet only, and after March but one steamer reached the Bund. All merchandise had to be lightered to and from the Concessions, with the attendant delays and losses by damage and theft, which, as always, materially increased the laying-down cost of the cargo.



HAI-HO CONSERVANCY.—Showing Method of Excavating the Fourth Cutting

The sentence, "Though no steamer has been able to reach the Bund during the year (fortunately an unprecedented event)," introducing the Trade Report for 1898, tells its own story.

A SHIPLESS PORT

During 1899 the river 30 miles above Tangku was so nearly unnavigable that only two steamers succeeded in reaching the Bund that season.

So much, then, for a condensed statement of the palpable manifestations of the disease. The diagnosis and exposition of the root of the trouble were more difficult to arrive at. It was evident, however, that the problem presented was: how to dispose of—or, better, how to assist the river to dispose of—the inevitable amount of silt brought down, chiefly by the Hun-Ho (渾河), from the mountains and plains of the hinterland. The distressing rapidity with which the bottom of the river rose in some seasons

during the two worst months, July and August, and the other vagaries of this unwelcome clog on the wheels of trade, rendered impossible any sure prediction of what the conditions of navigation were going to be a week ahead. Often the high-water mark lapped far above its usual line, yet ships could not come up, because the bottom of the river had risen so much more in proportion—forcing the water out into the distributary canals and channels—that there was much shallower water than with a lower surface.

During the earlier years the river seemed better able to carry down the burden imposed upon it, and its inability to scour out in the succeeding seasons was believed to be due to the unfavourable changes in the condition of the stream between Tientsin and Taku, whereby the scouring power of the tide was greatly diminished. In 1896 Mr. Aglen, then Commissioner of Customs, Tientsin, wrote: "There are residents now in Tientsin who can remember when ships were wont to swing to the flood at Tzu-chu-lin; there is now a barely perceptible rise and fall." Certain it was that expert opinion held that the remedy lay in confining more of the water of the confluent streams within the banks of the Hai-Ho, and giving it a clearer, straighter course to the sea, so that both the current and the tide could have freer action. How this has been done will be dealt with hereafter, after the organisation of the various efforts towards conservancy have been treated.

Making a Start

The first tangible effort to improve the river seems to have been that made in 1890, when, after the disastrous spring floods of that year, Viceroy Li Hung Chang was induced to allow Mr. A. de Linde to make the surveys on which was based the proposal by Mr. Detring, Commissioner of Customs, of an extensive scheme that contemplated an outlay of a million taels. This proposal had the great advantage, but dimly realised at the time, of beginning the conservation work before the state of the river, as regards navigation, should have become as disastrous as it since has. Although the money for its prosecution was available, this timely plan met such strong opposition from the local Chinese officials that it had to be abandoned.

Later years witnessed a change of front. In April 1897 the Native authorities had a dredger at work, from time to time, in the North-west Reach, without, however, producing any appreciable result; for what was needed, as stated above, was not the removal of silt from one or two places, but, rather, the prevention of the deposit. This a dredger could not do. Nevertheless, the attempt showed a welcome readiness on the part of the Native officials to take active measures; and an earnest of their willingness to co-operate with the Foreign community appeared in the proclamation of His Excellency Viceroy Wang Wen Shao, defining the nature and scope of the proposed works and bidding the people offer no opposition. The proclamation was as follows:

"The Hai-Ho has lately silted up to such an extent that steamers can no longer come up to the Settlements, thereby causing losses to the merchants.

"Sometime ago I discussed with the foreign Consuls the question of closing the canals and they proposed that Mr. de Linde should carry out this work, the cost of which will be defrayed by Foreigners and Chinese.

"Work will be started on the first of August, 1898. I have appointed the Customs Taotai to be the president and Chang Tajen, Wang Tajen and the Commissioner of Customs to assist him on the Board.

"All materials are to be bought by Mr. de Linde and if, when he buys the necessary land, there should be any difficulty he can report to the Customs Taotai who will appoint an official to settle matters.

"All employees must obey the Engineer or he will dismiss them at once, and if anyone tries to obstruct the work he will be sent to the Yamen.

"These river works will be finished in two, or at the most two and a half years.

"I issue this proclamation to the people living on both sides of the river and you should understand that the work is for the good of the people and the merchants. It anyone should try to obstruct the progress of the work or create trouble he will be punished at once."

Sino-foreign Co-operation

This co-operation had already begun to take definite form in the negotiations which the commercial community, spurred on to activity by the deplorable condition of the river in 1896, opened with His Excellency the Viceroy. Early in 1897 Count Du Chaylard, Consul General for France and Doyen of the Consular Body, Mr. H. B. Bristow, H.B.M.'s Consul, Mr. Edmund Cousins, chairman of the Tientsin General Chamber of Commerce, and Mr. A. de Linde, as adviser, agreed with His Excellency Wang Wen Shao in reference to the undertaking of the first part of the conservancy work, at a cost of Tls. 250,000, and to the appointment of a mixed Commission to prosecute and continue it. This, the first Hai-Ho Commission, was constituted as follows:—

The Tientsin Customs Taotai.

The Chinese officials nominated by the Viceroy as the representatives of the two principal Chinese companies—China Merchants Steam Navigation Company and Chinese Engineering and Mining Company.

The Commissioner at Tientsin of the Chinese Imperial Maritime Customs.

Representatives of the different shipping and lighter Cos.

" " Foreign Concessions (in existence at that time).

" " General Chamber of Commerce.

Although this Commission, as such, never met, the business was conducted by meetings of the Customs Taotai, the Senior Consul, and the Commissioner of Customs. The necessary funds for the Commission's operations were provided by a contribution of Tls. 100,000 by the Viceroy, and from the proceeds of a loan of Tls. 150,000 authorised by the landrenters at their meeting of the 25th June, 1898, and consequently guaranteed by the Municipality of the British Concession. To meet the interest on this loan and to provide for its amortisation, it was agreed, with the approbation of the Chinese authorities and the Foreign Ministers at Peking, to levy an extra duty of ½ per mille ad valorem on all merchandise, which duty was to be collected by the Imperial Maritime Customs. The loan, at 6 per cent. was financed by the Hongkong and Shanghai Bank, the money turned over to the Commission on the 2nd August, 1898, and, with the contribution transmitted by the Viceroy the previous month, furnished the necessary working capital. This work consisted chiefly in the construction of three locks—one in the Lutai (蘆臺) Canal at Chen Chia Kou (陳家溝), one at Chun Liang Cheng (軍糧城), and a third at Taku (沽大) —besides the rounding off of several bends and the training, by means of piles and lateral groins, of some of the most shallow reaches. With these improvements completed in June, 1900, the task of the Commission in the preliminary work contemplated was changed to one of maintenance only, until further operating funds could be procured. Just then, however, the Boxer disturbances, with their concomitant evils, wrought serious damage to the works erected, and marked, as it were, the end of the effectual work of the old Commission.

Results of Preliminary Measures

But before passing on to the next phase of the question, it may be well to record the opinions of observers of the perceptible results obtained by these preliminary measures. One observer writes:—"Has the river improvement scheme of Mr. de Linde achieved its object of enabling steamers to get up to the Bund at Tientsin? As a matter of fact, steamers did not and probably could not have come up to the Bund. On the other hand, the closing of the lock at Chen Chia Kou produced at once an increase of 15 to 18 inches in the depth of the Hai-Ho. The training works in certain parts of the river, from which Mr. de Linde expected much, were interfered with so constantly by villagers—and, perhaps, soldiers—that they did not have a fair trial. In short, the scheme as a whole did not get a fair trial in the summer of 1900." Another says:—"During

January, 1900, the beneficial effects of closing the lock in the Lutai Canal became apparent, inasmuch as the depth of the water increased perceptibly and the amount of silt deposited during the month was considerably less than in January of the preceding year.'' Then, again, when the mud dam at the mouth of the canal gave way—or was destroyed—in April, 1900, its restoration in May was marked by an immediate rise of 2 feet 3 inches in the river. Whatever the then opinion may have been, the subsequent prosecution of the whole scheme of which these works formed the initial step has fully justified the claims of its sponsors.

For the damage wrought during the summer of 1900 a claim was made upon the Chinese Government, through the Consular Body, for Tls. 126,000; and the sum finally allowed, Tls 80,158, provided an available security for a fund for the rehabilitation of the injured works.

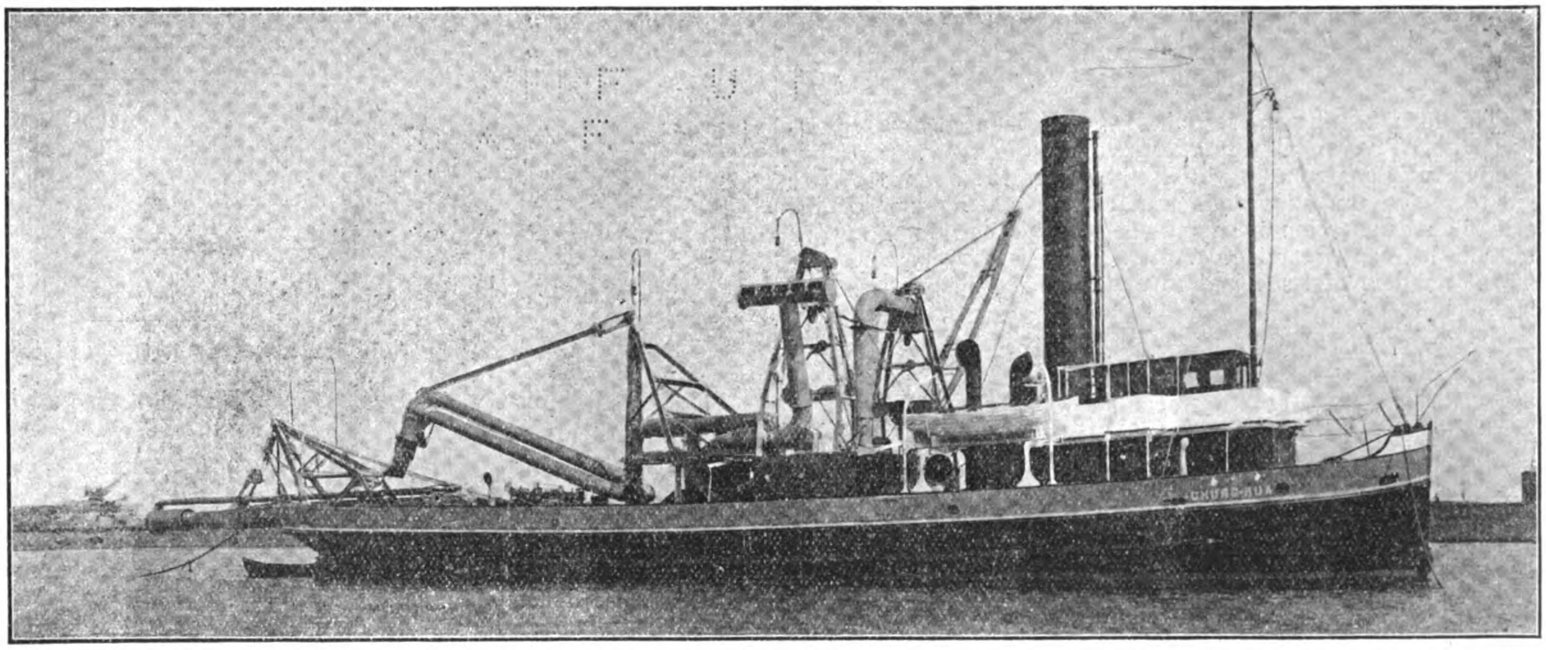
The few remaining steps taken to conserve the river before the present Board was organised and began operations were those of the British Military authorities, who during the summer and autumn of 1900 availed themselves of Mr. de Linde's services to maintain the river at as high a point of navigability as possible—this in order that communication between Tientsin (and hence Peking) and the sea might be unimpeded for the movement of troops and supplies.

Second Phase of the Work

The second phase of this conservancy work may well be said to have been initiated in the winter and spring of 1901. At first, during the disorganised conditions of trade and administration, it seemed doubtful in just whose hands resided the power and means to carry on the work of the 1898 Commission. Owing to the inability of the Tientsin Provisional Government—under the "General Regulations for the Administration of the Chinese City" from which the Government derived its authority—to extend its jurisdiction over river matters, Field-Marshal Count von Waldersee issued, with the approval of the Commanders-in-Chief of the contingents of the Allied Powers, the new "General Regulations for the Provisional Government of the District of Tientsin" which extended the jurisdiction of the Council to the sea, and which contained the clause reading, "Within the district so entrusted to it the Council must, with its own administration,.......... complete the public works begun and undertake those which may seem necessary—maintain and improve the communications by rivers and canals." This cleared the way for the Council of the Tientsin Provisional Government to take action which it did by electing three of its member—Major-General de Wogack, Lieutenant-Colonel Arlabosse, and Lieutenant-Colonel Bower—to constitute a Commission to prosecute and supervise the conservancy work. Unfortunately, owing to some misunderstandings which seemed to float away under the mellowing influence of time, the newly-constituted Board did not feel free to go ahead until a feeling of greater unanimity between the various local interests and bodies assured its more general support. The question of the Board's constitution and the methods to be employed in providing the needed moneys were the subjects of some little negotiation between the Consular Body, the General Chamber of Commerce, the Diplomatic Body in Peking, and Count von Waldersee, until, after many proposals and counter-proposals, it was agreed between the Doyen of the Corps Diplomatique and Count von Waldersee, acting for the Commanders-in-Chief, that the members of the Board should be reduced to the three following: a member of the Provisional Government, a member of the Consular Body, and the Commissioner at Tientsin of the Chinese Imperial Customs; to whom were added, with consultative voice only, representatives of Commerce, shipping, and the Foreign Concessions. The Commission was "to examine the question of improving the navigability of the Hai-Ho, technically and financially, and to take, in an independent way, such steps as would satisfy all parties interested in the matter." Not an easy task was thus set for them.

The Conservancy Board

As reconstructed, the Board consisted of Major-General de Wogack, a member of the Council of the Tientsin Provisional Government; Mr. L. C. Hopkins, H. B. M.'s Consul; and Mr. Detring, Commissioner of Customs. The only change that has subsequently taken place in the constitution of the Board was the withdrawal, on the 15th August, 1902, of the representative of the Tientsin Provisional Government, which on that date passed into history, and the assumption of his powers by the Customs Taotai, appointed in accordance with the terms of the Peace Protocol. Naturally there have come, from time to time, many changes in the personnel of the Board and of the general Commission—the consulting members,—owing to changes in the offices holding the right of representation. As it was stipulated at the outset that the Board, in order to give more direct control to the commercial and shipping interests over the funds expended (which were to be largely derived from these interests,) should appoint for its honorary treasurer a man prominent in the commercial life of the port, this important post has been filled consecutively by Mr. W. W. Dickinson, chairman of the Chamber of Commerce, and a member of the general Commission; by Mr. W. Fisher, chairman of the British Municipal Council and also a member of the general Commission; by Mr. J. M. Dickinson, chairman of the British Municipal Council and of the Chamber of Commerce, and by Mr. W. E. Southcott, Chairman of the Chamber of Commerce.



Hai-ho Conservancy.—Suction Dredger for deepening Taku Bar Channel built by Werf Gusto, Firma A. F. Smulders, Schiedam, Holland

What this Hai-Ho Conservancy Board, upheld by the all-important action of the land-renters, has actually accomplished may be best approached by an examination of the means used to finance the Board's schemes; then a statement of the work done and of that in contemplation will be added.

Providing the Funds

The initial difficulty in securing funds for the 1898 Commission was overcome, as stated above, by the contribution of Tls. 100,000 by the Viceroy, and the issuing of the British Municipal loan, for Tls. 150,000, known as the British Municipal Loan E, 1898. This bore interest at 6 per cent.; repayment was to commence at the expiration of one year from the date of issue; the whole amount was to be redeemed within 12 years; and the payment of interest and principal was secured by a levy of River Dues of ½ per mille ad valorem on all imports, re-imports, and exports—being 1 per cent. of the regular Customs full duties—for the period of 12 years, as well as by the property and assets of the British Municipality. This loan ran from the 1st August 1898 and amortisation was completed on the 31st July, 1906.

For the first formidable task of the Board—the excavation of the two upper Cuttings—the second credit, Hai-Ho Conservancy Loan A 1902, for Tls. 250,000, bearing interest at 7 per cent. and fully redeemable in 22 years, was issued by the Board itself.

This supplemented the grant of Tls. 250,000 by the Tientsin Provisional Government. The loan had for its security an additional 1 per cent. of Customs Duties, and was guaranteed in principle on a pro rata basis by the various Foreign Municipalities. This loan was extinguished on the 1st October, 1910.

The next loan, Hai-Ho Conservancy Loan B, 1903-4—the proceeds of which were to furnish funds to make the third cutting—amounted to Tls. 300,000. It carried practically the same conditions as the second loan, in that it was to yield 7 per cent. to the investors, to be redeemed in full in 25 years, and had the same securities in an additional 1 per cent. of Duties as added River Dues. This loan was finally redeemed on the 15th September, 1911.

After protracted negotiations the assent of all the interested parties was secured in November 1908 to a further loan of Tls. 870,000.

This loan was to cover the following programme :—

1. Purchase of 4 light-draught Tugs for Raking.
2. „ „ sea-going Bucket dredger.
3. „ „ 6 mud barges.
4. „ „ 1 Tug boat.
5. „ „ Floating pumping station.
6. „ „ Pipe line for discharge ashore.
7. „ „ Floating discharge pipe and the making of the fourth cutting, including purchase of a bucket dredger.

This loan, bearing interest at 6%, was financed by a levy of River Dues of 4% of Customs Duties and a Shipping Tax of one mace per registered ton on vessels that cross the bar and of five candareens per ton on vessels that remain outside the bar, the latter to have the option of paying one mace per ton on all inward and outward cargo carried. Amortisation is to commence five years from date of issue and to be completed in twenty-three years.

The first imposition of River Dues (½ per mille ad valorem on all merchandise—that is, 1 per cent. of Customs Duties) was made on the 1st August, 1898 ; the second (2 per cent. of Customs Duties) on the 15th October, 1901 ; the third (3 per cent. of Customs Duties) on the 1st September, 1903 ; the fourth (3½ per cent. of Customs Duties) on the 1st June, 1908 and the 5th (4% of Customs Duties) on the 1st January, 1909.

The amounts yielded by the River Dues are as follows :

		Taels.
1898	August to September (1 per cent. of Customs Duties)	10,275
1899	(1 per cent of Customs Duties	22,302
1900	„ „ „ „	8,608
1901	(1% of Customs Duties; 2% from 15th October)	14,528
1902	(2% of Customs Duties)	63,691
1903	(2% of Customs Duties; 3% from 1st September)	53,119
1904	(3% of Customs Duties)	70,720
1905	(3% of Customs Duties)	111,439
1906	„ „ „ „	117,327
1907	„ „ „ „	101,318
1908	(3% of Customs Duties 3½ from 1st June)	85,574
1909	(4% of Customs Duties)	123,005
1910	„ „ „ „	127,419
1911	„ „ „ „	122,985
1912	„ „ „ „	128,206
1913	„ „ „ „ to 31st October	117,310
	Total Tls... ..	1,277,826

The Shipping Tax collection has been as follows :

		Tls.
1908	.. ..	26,327
1909	.. ..	95,336
1910	.. ..	93,407
1911	.. ..	107,001
1912	.. ..	91,648
1913	.. .. .. to 31st October ..	82,409
	Total Tls.	496,128

A monthly grant of Tls. 5,000 was made by the Tientsin Provincial Government from 1st June 1901 to the 15th August 1902, which has since been continued by the Chinese Government in accordance with the Peace Protocol as a monthly grant of HK: Tls. 5,000

Making a total to date of Hong Ping Tls. 778,625.

The following is a summary of loans, etc.,

	Tls.
Viceroy's contribution of 1898..	100,000
British Municipal Loan E. of 1898..	150,000
Tientsin Provisional Government grants during 1901	250,000
Hai-Ho Conservancy Loan A. 1902	250,000
„ „ „ B. 1903-4	300,000
„ „ „ C. 1909-10	870,000
„ „ „ D. (1st issue) 1912	175,000
Total Tls.	2,095,000

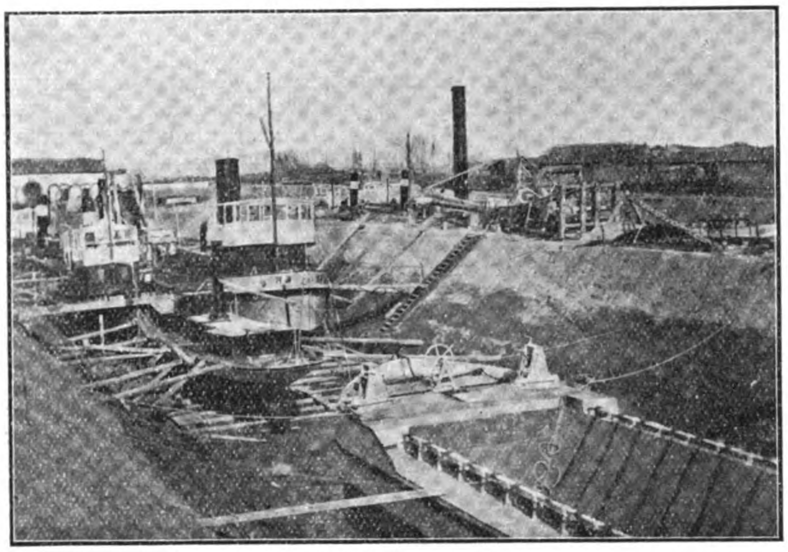
Of these loans C. and D. are still outstanding.

Miscellaneous receipts have been :

	Taels.
Interest..	40,719
Rent of land	2,606
For filling supplied	92,000
Total Tls.	135,325

The total of monies received by the Commission since its inception has therefore been,

	Taels.
River Dues collection..	1,277,826
Shipping Tax collection	496,128
Loans, etc., ...	2,095,000
Government grant, ...	778,625
Miscellaneous	135,325
Total Tls.	4,782,904



HAI-HO CONSERVANCY.—Commission's Dock

The assets of the Commission to-day are :

Dredging, etc., plant:	Tls.	
500 C. M. Dredger "Hsin-Ho" ..	210,000	
" " "Chung-Hua"	130,000	
125 " "Pei-Ho" ..	20,000	
Grab-dredger	8,000	
Pipe Lines	30,000	
Tug "Hun-Ho"	31,000	
Ice-Breaker "Tung-ling"	98,000	
" "Kai-ling"	50,000	
Four raking Tugs	65,000	
Launches	5,000	
7 Steel barges	66,000	713,000
Workshop, lands, buildings, etc., ...		120,000
Stores and spare parts		15,000
Bank Balances		160,000
	Tls.	1,008,000

Deducting this sum from the total receipts the balance Tls. 3,774,904 represents the cost to Tientsin of improving and maintaining its waterway from 1898 to the present day.

To arrive at the amount actually expended on river works we must deduct the cost of Taku Bar work Tls. 246,000, which will be dealt with separately, and the monies devoted to payment of interest and amortisation of loans which come to Tls. 1,536,-644.

We have thus approximately two million Taels as the sum which has been expended by the Commission on river conservancy. When the Hai-Ho Conservancy Board began operation in the fall of 1901, its plans called for the cutting out of many of the bends between Tientsin and Taku, the training of more of the reaches, and the continuation of the old policy to keep as much water in the Hai-Ho as possible by means of a system of locks on the distributary canals. Five cuttings were in contempletion.

WORK IN EARLY DAYS

Early in October 1901 the Board contracted for the excavation of the first two of these, to a depth of 23 feet, for Tls. 270,000, and work was begun on the 21st October of that year. As shown on the map, the first cutting, 0.75 mile long, extends from Kua-Chia-Ssu (掛甲寺) to Yang-chuang and has eliminated the Tientsin Bend and Match Factory Bend and the so-called East Reach, of which the two former were difficult of navigation owing to the small radius, while the latter was a very shallow place because of the great width of the river. As the length of the old river eliminated was 2.1 miles, this cut effected a saving of 1.35 miles. The second cutting, extending from Hsia-Chuan (下圈) to Ho Chia Chuang (何家莊), is 1.1 miles long, and has done away with the Double Bend and the Vegetable Bend, besides two other sharp curves between the Arsenal and the Vegetable Bends. Here, again, 42 miles of winding river were reduced by 3.1 miles ; thus making the total reduction in distance effected by these two cuttings about 4.4 miles. Their excavation to a depth of 23 feet below the surface of the soil, and to widths varying from 325 to 360 feet, necessitated the removal of nearly 550,000 fang, or, approximately, 2,200,000 cubic yards of earth—an amount which no layman can well appreciate until he climbs one of the mounds on the bank of the cutting and looks along the small mountain of earth that has been thrown up there. The first cutting was opened to shipping late in July 1902, and the second early in September of that year. Their successful completion, and the great economy effected by them, confirmed all in their belief in the Board's general scheme and stimulated the action which led to the prosecution of the plans for the third cutting. Work upon this, was commenced in September, 1903, and continued, after the cold weather ceased, until the end of June, 1904. This new highway runs between the village of Yang-Chia-Ch'ang (楊家場), at the Lower Tombs Bend, and Hsin-chuang (辛莊), above Ni-wo. In just a little over 2 miles it has shortened the river's course by over 4½ miles, thus effecting, with the two upper cuttings, a saving of nearly 9 miles in the run between Tientsin and Ni-wo; moreover, it eliminated the three worst bends then left in the river—the Lower Tombs Bend, the bend at Handsome Point, and Pai-T'ang-K'ou (白塘口) Bend—together with some other bad places. An appropriate ceremony was observed in the opening of this cutting by a representative of the Native authorities of the province; Admiral Yeh represented His Excellency Viceroy Yuan Shih K'ai, and, through him, the great numbers of people in this region who derive the inevitable benefits of every enhancement of the port's trade. In the Autumn of 1908, as stated above, the sanction of all the interested parties was obtained to the next and greatest scheme which involved the making of the Fourth Cutting and the purchase of dredging and pumping plant and of four Tugs for work on the Taku Bar.

As originally contemplated the Fourth Cutting was intended to cut off two bends comprising four reaches, viz : The East Reach, the Hsien Sui Ku reach in the first or upper bend and the Hupeh Reach and Stone Reach in the lower bend. The prices asked for the land proved, however, so exorbitant that it was only found practicable to proceed with the upper and more important section of the cutting. The length of this cut is 2.36 miles and it has shortened the river by 5.6 miles. The total mileage cut off by the four cuttings is 14.7.

This cutting was made by dredger instead of manual labour. The dredger employed was a 500 C.M. bucket dredger with pumping installation.

HAI-HO CONSERVANCY.—The Workshops

Three cuts were made: the first 189 feet wide and 12 feet deep on the South side, the second of similar dimensions on the North side and the third a channel 200 feet wide and 7 feet deep at the upper end and gradually increasing to 220 feet wide and 9 feet deep at the lower end.

The first two cuts were made by dumping the soil directly into the suction well of the sand pump and the mixing has been produced by delivering the water jet, raised by the centrifugal pump, over the knife grill. This method was necessitated by the hardness of the soil and by the quantity of stiff roots encountered.

The third cut was made by dumping the soil over a grill of knives, where, in addition to the water jet, the revolving cutter assisted the mixing.

The total excavation was 3,200,000 cubic yards or 865,000 fang and the time occupied was 7,500 working hours. The dredger commenced work in June 1911 and the cutting was opened to traffic in July, 1913.

The cost of excavating the cutting (excluding purchase of land, houses and graves, but including Tls. 74,000 for depreciation of plant) was Tls. 236,200 or 27.3 candareens per fang.

The contract for digging the third cutting by hand was at the rate of Tls. 0.43 per fang.

It may be here stated that the making of further cuttings between Tientsin and Taku is not deemed advisable for the reason that the increased scour would be more than the river banks could withstand and would entail very heavy expenditure on bank protection.

Many other minor works have been carried through by the Board, as integral parts of the whole plan—such as the training of many of the reaches, narrowing the river where too great width has militated against its depth, and the care of the canal connexions,—of which space will not permit a description in detail; yet of these lesser achievements it seems worth while adverting to some that stand out above the others. Mr. de Linde, as his first serious attempt, in 1898, to confine more water to the river's bed erected a weir and lock on the Lutai Canal at Chen Chia Kou; this was badly damaged during the Boxer troubles. The Board repaired the damage in 1902, and erected a new lock beside the old one, which can accommodate 30 or 40 boats at one time, instead of the single one to which the capacity of the old lock was limited. His Excellency the Viceroy was present at the opening of the new lock on the 24th September, 1902.

Another piece of work deserving special mention has been the widening of the river at the Concessions. In earlier years the steamers that came up to the Bund were compelled to drop down stream stern first over a mile before they could find water enough to turn; then in July 1903 the removal of the German military bridge rendered possible the making of a swinging-place just off the upper end of the German Concession; and at present the widening opposite the Bund has proceeded so far that a large proportion of steamers swing right abreast of their wharves.

The erosion of the concave at the lower end of the First Cutting has been arrested by protection work of *Zinkstuk*, which were here used for the first time on the Hai-Ho. A length of about 1,400 feet was protected at a cost of Tls. 4.00 per foot. The protection has stood well and has effected a great improvement in that it has diverted the channel towards the middle of the river.

Disposal of Mud

With the aid of the pumping station provided for under Loan C. of 1909-10 the question of the disposal of dredged spoil has been solved to the mutual satisfaction of Concessions and Commission. The silt annually dredged from the harbour to provide sufficient width at the wharves is now pumped into the lowlying land and ponds in the Concessions in the development of which it is of material assistance as the cost is considerably lower than that for filling from other sources.

The quantity of mud pumped into the French and German Concessions since the pump became available is

1910.	38,586	fang
1911.	60,970	„
1912.	53,885	„
1913.	99,000	„

The dredging done in the Harbour for the past three years is in excess of the actual requirements of shipping but the receipts for filling more than cover the cost of such dredging as is done only to meet the demands for filling from the Concessions. The advantages of raising low land in this manner are obvious: firstly it is cheaper and secondly not only is it unnecessary to take earth from other places to raise properties on which it is desired to build and thereby create noxious ponds near dwelling houses; but the ponds already in existence, which are a menace to the health of the community can also be filled up. It would hardly be an exaggeration to say that this method of filling has revolutionised the prospects of some areas in the Concessions.

Benefit to Shipping

The manner in which shipping has benefited from the improvement of the Hai-Ho is shewn in the following ***resume:*** During 1902 the river was freely navigated up to the Bund, by sea going steamers, in seven to eight hours. On the 21st August of that year the S.S. "Lienshing" arrived in the harbour as the largest vessel that had reached the Bund since the 12th April, 1899. During November 1902 the steamers "Taishun" and "Anping" of the China Merchants Company, came up with a length of 270 feet between perpendiculars—or some 10 feet more than the "Lienshing." In the three Autumn months 77 sea going steamers came up on draughts of from 9 feet 6 inches to 10 feet 6 inches. During 1903 there were 333 sea going merchant vessels that navigated the river to the Bund, one of which came up on a draught of 11 feet 8 inches. 374 vessels came to the bund in 1904 and on the 18th October the S.S. "Anping" came up on a draft of 11 feet 9 inches. Two days after the opening of the 3rd cutting the S.S. "Kwangchi" made the journey from Tongku to Tientsin in 4 hours, 10 minutes which was exactly one hour less than the record existing previous to the opening of the cutting. On the 14th August, however, the S.S. "Anping," with wind and tide greatly in her favour, made the passage down from the swinging place at Tientsin to Tangku in 3¾ hours. During 1905 vessels to the mumber of 395 came up to the bund. Early in that year the Harbour Master (Mr Susemihl) placed on official record that he doubted if for as long as foreign vessels had navigated the river it had ever been better—soundings on the 31st March showing, at high water, nothing less than 13½ feet in the fairway the whole length of the river between Tangku and Tientsin, the tide on the Bar being 9½ ft. The deepest draught vessel that actually came up the river was the "Admiral v. Tirpity," drawing 11'.7". The feature of the year was that, owing to the widening of the river at the Concessions, a large proportion were enabled to swing at their berths. On the 21st July the longest steamer that had probably ever visited Tientsin, the S.S. "I-chang" (275 feet between perpendiculars) swung abreast of the Harbour Master's office with some 20 feet to spare, drawing 9'.6" aft and 6'.6" forward.

In 1906 the river was navigated to the bund by 444 steamers and of these 150 swung at their berths. Save on a few exceptional days a steamer could, at high water, have come up to the bund at any time during the year on a 12 feet draught. During 1907 out of 856 vessels which visited the port 513 came up to the bund of which 267 swung at their berths.

The river was in better condition than ever, the S.S. "Lienshing" came up drawing 12'.11" forward and 13'.6" aft and the average draft was considerably deeper than in former years.

In 1908 the total number of entries was 788 and of these 511 came up to the bund and 323 swung at their berths.

The deepest draft vessel to come up the river was the S.S. "Tingsang" drawing 13 feet on even keel.

During 1909 there arrived at the bund 623 steamers out of a total of 1,006 entries of which 54 had a draught exceeding 12 feet.

In 1910 of 992 entries 617 came to the bund of which 130 had a draught exceeding 12 feet.

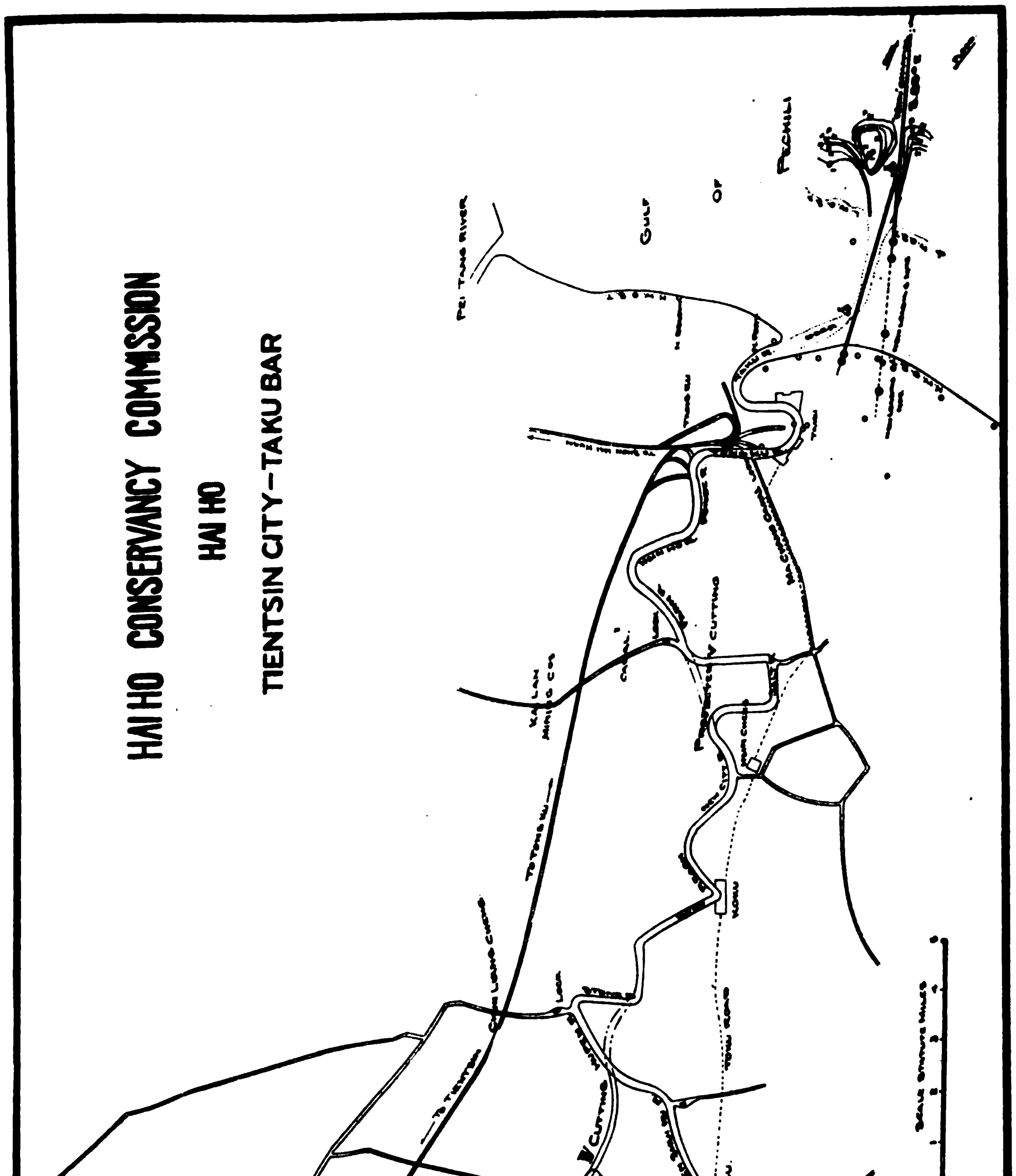
The total entries in 1911 increased to 1,198 and of these 698 came to the bund. The draught of 137 vessels exceeded 12 feet and 20 of this number were drawing more than 13 feet. A

record was established by the S.S. "Varg" on the 17th July, her draught being 13'.10" aft and 14 feet forward. The minimum depth available in the river at ordinary High Water was from inside the Bar to Tongku 20 feet and this depth gradually decreased to 13 feet 6 inches at Tientsin.

The record for 1912 is not so satisfactory and there was a marked decrease in the draught of vessels coming to the bund. This was not due to any deterioration in the river but to the shoal state of the Taku Bar consequent on the heavy deposit of silt brought down by the exceptional rainfall.

In 1913, up to November 30th, of 949 vessels entered at the port 672 came to the bund. On 3rd October the S.S. "Vestfold" came up on a draught of 13'.11". Several vessels have made the trip to and Tongku in 3 hours and 20 minutes and one ship accomplished the voyage from Chefoo to the Tientsin Bund in 20 hours, which, as far as is known, is the shortest time on record.

It should be noted that increased draught of vessels navigating the river to Tientsin in 1907 and subsequent years does not indicate that the river had improved in proportion over the years immediately previous. Prior to 1907 the river could carry a deeper draught than the Bar and it was the improved depth of the latter, brought about by raking and scour that enabled vessels to come up river on a deeper draught.



The first instalment of Fcs. 1,000,000 of the loan of francs 8,000,000 to be made to the Government of China by the Banque Industrielle is reported to have been paid over on December 29.

It is stated that Messrs. Lever Bros., the Brunner Mond, Crossfield, Gossage and Erasmic companies have combined for the purpose of manufacturing soap and allied products in China. The capital of the companies concerned is £30,000,000. A factory is to be erected shortly at Shanghai.

THE JAPAN STEEL WORKS

Admiral Yamanouchi, President of the Japan Steel Works, at the last general meeting of the Company expressed his intention of resigning his post at the earliest opportunity that offered. Representatives of Messrs. Armstrong and Vickers have been for some time in Japan inspecting the conditions, and conferences have been held.

As the reason for his resignation the Admiral stated at the last meeting that though the business for the preceding term had again resulted in a loss, the business was now nearing the corner, and already surpassed the Naval Steel Works at Kure. Therefore there was no necessity for him to remain in office. It is understood in business circles, however, that the Admiral is dissatisfied with the policy followed by the Company, which, in the Admiral's opinion, is quite at variance with the original objects for which the works were established.

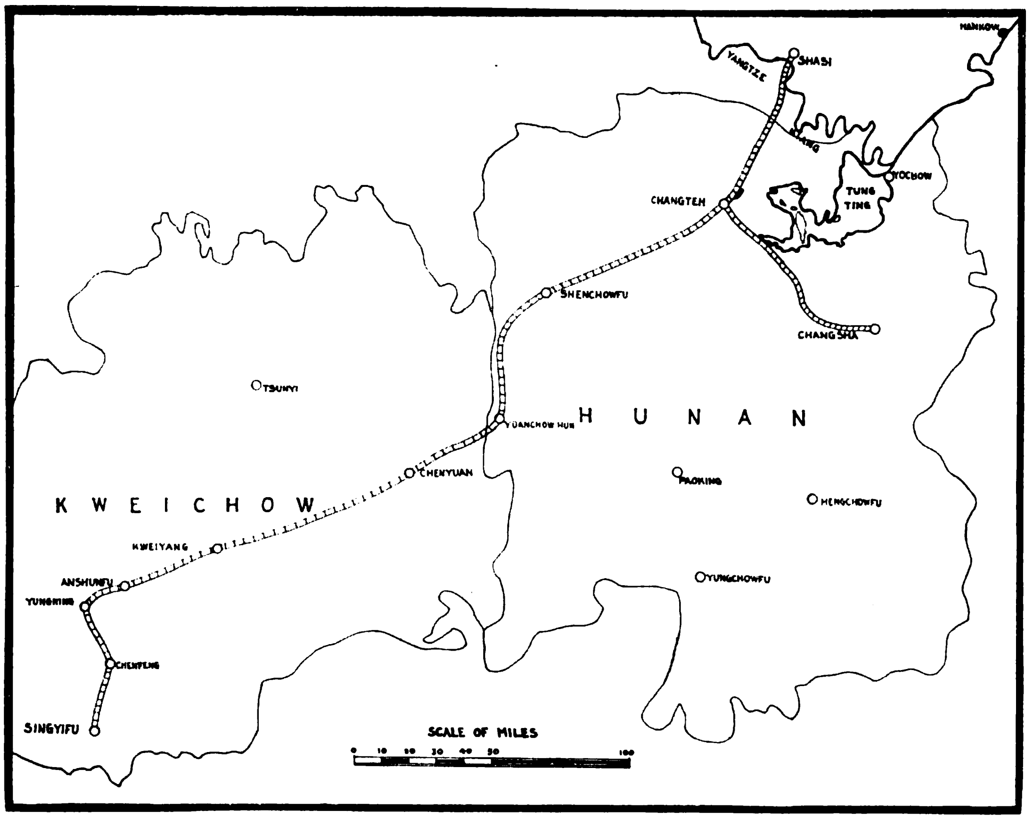
It is believed that the Admiral's resignation will lead to a change in the Board of Directors. —*Japan Daily Mail.*

NEW RAILWAY THROUGH HUNAN AND KWEICHOW PROVINCES

INTRODUCTION OF THE PERCENTAGE CONTRACT CONSTRUCTION SYSTEM IN CHINA

On December 18th, the Minister of Communications, H.E. Chow Tsz-chi, on behalf of the Chinese Government, entered into an agreement with Lord ffrench, representing Pauling and Company, Limited, of London, for the financing and construction of a railway from Shasi on the Yangtzse to Shingyi in South Eastern Kweichow.

This contract is a modification of the one signed by Dr. Sun Yat-sen and Lord ffrench on July 4th ulto. providing for a railway between Canton and Chungking. The Canton-Chungking line had been designed as the shortest route from the rich and populous province of Szechuan to deep water at Canton. With the great development of trade and commerce incidental to the opening of Szechuan to rail transportation, the shortest route to the sea was imperative to the future prosperity of the province, and as Canton was 250 miles nearer than Shanghai, this route was naturally selected. The only difficult section of the proposed line was the 160 miles between Fuchow on the Yangtze up the Wukiang valley to Szenanfu. This section also passed through a sparsely settled country, but once the through line was completed, and the trade of Szechuan could find its outlet to Canton, it was hoped that the line would become one of the most profitable in China. The crowded population of Szechuan would have found opportunities for colonizing the valleys of Kweichow and thus aided in building up the prosperity of the proposed line.



Rough Sketch of the Shasi-Shingyi Railway

The railway as projected followed the existing route of the Yueh Han Railway to Samshui, and from that point would have passed through Shiuhing and Takhing to Wuchow, thence up the Kwei River Valley through Pinglo to Kweilin, and from there over the Nanling mountains to Yuanchow. From Yuanchow the route was through Tungyenfu to Szenanfu, and thence down the valley or gorge of the Wuking to Fuchow on the Yangtsze, where it would connect with the rails of the Szechuan Railway to Chungking and Chengtu.

The contract with Messrs. Pauling and Company had been initiated in London in April last by Dr. Sun Yat-sen's representative and provided for the construction of the line under contract in which the contractor's profit was a fixed percentage over and above the actual cost of construction and equipment.

The usual recognized and legitimate basis of profit on large construction contracts of this nature is fixed at ten per cent. The American Government allowed fifteen and a half per cent. over the actual cost of the Philippine Railways as the contractor's and financier's profits. The British Government is paying ten per cent. profit to the contractors on the largest harbour works construction in Great Britain, and the Indian Government is also allowing ten per cent. profit on engineering and construction work. Messrs. Pauling and Company, for reasons purely applicable to China, were prepared to undertake the contract at a lower percentage than the usual practice and custom, largely to convince the Chinese of the advisability of having their railways constructed under a different system than the depart mental one. Owing to the fact that all foreign financed railways in China have hitherto been constructed under loan agreements providing for engineers nominated by the Banks, the experienced contractors who have constructed thousands of miles of lines in other countries, were debarred from participating in the development of Chinese railways. These reputable contracting firms with years of experience behind them and an effective organization to operate with, could naturally construct railways more economically, efficiently and expeditiously than any one engineer nominated by the Banks, who had to create an organization before he could proceed with the work. The railways constructed under the departmental system, have in some instances been subjected to much criticism as to the costs of construction, but owing to the peculiar political situation surrounding the financing of Chinese railways, the Chinese Government has not been at liberty to modify the usual departmental loan terms.

In the past various contracting firms have offered to construct and equip railways in China on the same specifications of the best built and equipped loan built line at a price which on analysis proved that the actual cost would be from one-third to one-half the cost of those built under loan agreement terms. But as the European governments steadily preserved the monopoly in favor of the more expensive commercial methods, the experienced contractors were never permitted to enter the field.

The firm of Pauling & Company, Limited of London, enjoy the peculiar distinction of being the most experienced and capable railway builders in the world. They specialize in railway work alone, and maintain a splendid organization for the prosecution of their contracts. This firm has constructed over 2,500 miles of lines for the Rhodesian Government alone, and are permitted carte blanche in the carrying out of construction operations.

Messrs. Pauling & Company had endeavored for several years to gain a foothold in China, but the peculiar influences binding the British Government and the British Official Group, effectively closed the door to their entrance in the field as contractors.

It was because China's interests demanded some modification of the departmental and commercial system of constructing her

future railways, and because the period of concessions had come to an end that the negotiations were opened by Dr. Sun Yat-sen's representative with Messrs. Pauling & Co.. which led to the Canton-Chungking railway agreement. That agreement was, however, nullified by the cancellation of Dr. Sun's powers as head of the Chinese National Railway Corporation by the President on July 18th, and the Government refused to recognize the validity of any agreement entered into by Dr. Sun. Becoming convinced, however, of the soundness of the principle of railway construction on a percentage basis underlying the Canton-Chungking Railway contract, President Yuan decided to have it initiated in China, and the Minister of Communications negotiated another agreement for the above-mentioned route from Shasi to Shingyi.

Although the Canton-Chungking line was recognized as an essential trunk railway for the future development of the Republic, it was considered that it was not immediately necessary, and that the country's political needs demanded that the distant provinces should be linked with Hankow as soon as possible.

It was therefore decided to leave the Canton-Chungking proposal out of consideration and to adopt a line linking Hankow with the province of Kweichow and Yunnan. The terminus of the line was located at a point opposite Shasi on the Yangtzse, to be connected direct with Hankow by the German section of the Hukuang Railway, or by a separate line. From Shasi the new railway will strike southwards through Lichow to the treaty port of Changtehfu. From there a branch line will communicate with the Provincial capital and treaty port of Changsha and connect with the Canton-Hankow Railway.

From Chengtehfu the main line will proceed along the fertile and rich valley of the Yuan River, through Shenchowfu to Yuanchowfu, thence through Szechow, Chenyuan and Pingyueh to Kweiyangfu, the Provincial capital of Kweichow Province. From there it will proceed to Anshunfu and Yungning and thence south to Shingyi, the terminus. At this point it will connect with a railway to be constructed from Yunnanfu through Shingyi and thence south to Peseting, on the West River, and to Nanning.

The approximate mileage of the new line is as follows:—

Shasi To Lichow	50 miles
Lichow to Changtehfu	40 „
Changtehfu to Shenchowfu	110 „
Shenchowfu to Kienchowting	25 „
Kienchowting to Fenghwangting	20 „
Fenghwangting to Yuanchow	35 „
Yuanchow to Hwangchow	30 „
Hwangchow to Szechow	30 „
Szechow to Chenyuan	30 „
Chenyuan to Hwangping	30 „
Hwangping to Pingyueh	30 „
Pingyueh to Kweiyang	60 „
Kweiyang to Anshunfu	60 „
Anshunfu to Chenning	10 „
Chenning to Yungning	20 „
Yungning to Chengfeng	35 „
Chenfeng to Shingyi	40 „
	655 Miles
Branch	
Chantehfu to Yiyang	55 „
Yiyang to Changsha	50 „
Total	760 miles

The railway is most important for the political control of the country as well as for the opening of an exceptionally rich and productive region. It follows the old established trade route up the Yuan River valley, which from time immemorial the Chinese have employed to reach Kweichow and Yunnan. The Yuan River is navigable for small boats as far as Chengyuan in Kweichow, and from this point carriers are used exclusively until the Yuannan border is reached, where ox carts take their place With the completion of the proposed line westwards from Singyifu to Yunnan, the southwest will be brought into direct touch with the rest of the country.

SOUTH MANCHURIA RAILWAY.

ESTIMATES FOR NEXT YEAR.

According to the *Manchuria Daily News* the South Manchuria Railway stimates for the coming year amount to Y.11,176,000. The items are said tobe as follows:—

		Yen.
Railway	Main and Branch Lines	2,620,000
	Mukden-Antung Line	600,000
Shipping		25,000
Electricity		167,000
Gas		156,000
Harbour		2,160,000
Mining		3,320,000
Hotels		160,000
Land		1,743,000
Sundries		225,000
		11,176,000

(1) RAILWAY.

Main Line.—Earthwork Cutting for the site of the new railway station, Dairen, cutting, grading, construction of culverts, retaining walls and drains at places between Dairen and Changchun.

Bridging: Construction flood-opening on the Hun; the extension and reconstruction of other bridges.

Rail-laying: Relaying of rails in the compounds of the station at Dairen, Tashihchiao, Changchun, etc.; improvement of the sub-grade installing of tie-plates.

Stations: Construction of engine sheds, Dairen, and the auxiliary buildings; construction of warehouses at Mukden; installation of turntables at Dairen, Tashihchiao, and Changchun; construction of subterranean passageway in the railway station compound at Changchun; coaling equipments at Dairen and Tashihchiao; water-feeding arrangements at several places, etc.

Signalling: Installation of an interlocking of signals and switches; replacing of the telephone system with a more up-to-date installation.

Mukden-Antung Line.

Levelling and alterations in railway station compound at Penchihu; filling work at various places; constructions of sidings at Antung Station; replacing of the telephone service as on the Main Line.

Rolling Stock.

Construction of five locomotives, fifteen passenger cars, and 170 goods cars for the Main Line and the conversion and alterations of both passenger and goods cars; construction of a locomotive, four passenger cars, and 38 goods cars for the Mukden-Antung Line.

(2) SHIPPING.

Construction of a dredger and two hopper barges for use in connection with the Dairen Harbour Works: a coaling boat for Dairen Wharf and a steam launch for Yingkou Branch of the railway Wharf Office.

(3) ELECTRICITY.

As the demands for lighting service and motor power at Dairen, Mukden, Changchun, and Antung have risen, the extension of wires, the installation of additional switch-boards and the other accessory equipments are to be undertaken.

(4) GAS.

The existing service at Dairen is to be extended to Shahokou. Provision is to be made to meet the steadily increasing demands in the city of Dairen.

(5) HARBOUR WORKS.

Reclamation of the shorefront of Jijiko (East End); construction of Northwest Breakwater; reconstruction of quay wall; construction of the new third pier; continuation of reclamation work of 25,000 *tsubo* along the shore line of Hama-cho; Dredging work at Antung; bunding work at Yingkou.

(6) WHARVES.

Construction of permanent warehouses on East Quay; grading work in the compounds of the branch offices at Yingkou, Antung, and Shanghai, and reconstruction of roads.

(7) MINING.

In order to make up the shortage of output of coal at Fushun Collieries through the installation of the sand-flushing method at Oyama and Togo Shafts, two new inclines are to be excavated near Oyama Shaft and at Wantawu; Laohutai Pit is to be the next to have a similar installation; installations for the producer-gas plant and the turbo-generator plant installation of mechanical appliances for transportation of coal at the Collieries; completion of the equipments for transportation by electricity.

(8) HOTELS.

Extension of the Yamato Hotel at the railway station at Mukden and the furnishing of the new Yamato Hotel, Dairen.

(9) LAND.

Construction of roads and bridges, waterworks, parks, cemeteries, and crematoriums in the railway Area; levelling work for building lots; construction of new buildings for Central Hospital, Dairen, and extensions of branch hospitals at Yingkou and Antung; construction of the new buildings for the branch hospital at Mukden; additional equipments of branch hospitals at Liaoyang and Kungchuling.

Construction or extension of primary schoot houses at Haicheng, Mukden, and Lienshankuan, and the Chinese Primary School at Liaoyang.

Continuation of construction of the new premises for the Central Laboratory with its various divisions. and the installation of the machinery, etc.

Installing sundry arrangements at the Industrial Experimental Station at Kungchuling and its branch station at Hsiungyocheng.

Constructions, alteration, and repairs of the Company's Offices and the officials' residences.

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MINING REGULATIONS FOR CHINA

The Minister of Commerce and Industry, Mr. Chang Chien, is at present devoting attention to the framing of regulations which, if adopted, will place the mining industry of China upon a proper basis and permit of development with foreign capital, knowledge, and experience. The so-called new mining regulations which were published some time ago in Peking must not be taken as official. No definite or recently drafted regulations have as yet been adopted by the Government, but those that will become the law of the land will be based on regulations that have been in effect in the past, though the aim of the present Minister is to open the door to foreign capital and assistance. The regulations which were introduced to govern mining before the 29th year of the late Emperor Kwang-hsu limited foreign participation to four-tenths of the capital; those that were put into effect in the first year of Emperor Hsuang-tung permitted foreign investments to the extent of five-tenths, and those framed in the first year of the Republic reduced it again to four-tenths. It is the hope of Mr. Chang Chien to remodel this particular aspect of the regulations so that foreign capital shall have equal opportunities with Chinese, and so that the transference of shares shall be unrestricted.

The four chief points which require remodelling and which will receive attention deal (a) with the ownership of mining property, (b) the extent of mining areas, (c) the tax to the Government, and (d) foreign participation. In the past the owner of surface land had a claim to a substantial share of the profits from mineral development on his property, but that will be amended by the Government claiming ownership, for disposal as it thinks fit, of all minerals beneath the surface, thus depriving the owner of the surface to any claim to the wealth beneath unless he acquires it by virtue of a mining right. Whereas in the past it has been impossible to obtain any more than 960 mow of land for mining purposes it is now proposed to make the limit 10 square *li*, or ten times as much as formerly, and instead of the Government demanding a specified royalty from the mining company, proprietor, or promoter, as in the past, a tax will be collected upon the output of the mine. To give an impetus to development Mr. Chang Chien proposes, as mentioned above, that foreign capital shall be given greater facilities: that it shall have equal rights with Chinese capital. He expresses the idea (which he hopes to have embodied in law) that foreigners should be entitled to buy whatever shares they may like on the stock exchange, and it is his intention to establish stock exchanges under Government regulations, which will be open to foreigners and which will be the medium whereby foreigners may obtain scrip in mining ventures as and when they please. So far as foreign participation in the management of a mine is concerned Mr. Chang Chien has an open mind. He does not favor any undue or harassing restrictions being placed upon foreigners who subscribe capital, and so far as he is concerned he has no intention of embodying in the regulations any clause that will prevent foreigners taking part in the safeguarding and proper expenditure of their capital. The control of mining properties will be entirely in the hands of those who secure the mining rights. If a mine is to be developed by the Government the control will be in the hands of the Government, but if development is to be done by a Company then the Company will make its own arrangements as to how far those who subscribe the capital will be entitled to a share in the control. With a view to classifying the minerals of China and the areas in which they abound a Mining Bureau will be established, whose business it will be to attend to this work and carry on a continuous policy of development on behalf of the Government. Already the Minister has had a German mining engineer and a number of students to report upon the mineral deposits of Shansi province, and a similar work will be carried out eventually with regard to each province. The results will be compiled for public use, and it will be the aim of the Bureau to assist the investing public properly to develop the rich resources that are now practically untouched.

That Mr. Chang Chien may succeed in introducing a broad minded policy of development will be sincerely wished by all who have in the past suffered from the irksome restrictions of the Government and the opposition of the people. Mining has been

kept in check deliberately despite the fact that through its means the wealth of the nation could easily be multiplied a thousandfold, but since Mr. Chang Chien has demonstrated in his own home districts that he is far-seeing enough to realise the great advantages of modern machinery—for he has established many industries equipped with foreign manufacturing plants—there are grounds for believing that he will use every endeavor to bring to China the best that is available both in the matter of men, money and machinery for the establishment of her most important and most shamefully neglected industry upon a basis commensurate with her financial needs and vastness. It will be deplorable if at this stage of China's history the Cabinet does not see eye to eye with Mr. Chang Chien. They are the officials who are responsible for a final decision making for the adequate opening of industrial avenues to foreign capital, and without foreign capital and brains no proper industrial development can take place. So much depends upon the results of mining that it is impossible for foreigners, who have long learned what the chief source of wealth is, to understand the process of thought of the Chinese when they bar the way to the employment of the capital and energies of men who have the knowledge and experience which will best serve her at this important period of her existence.

CONSERVATION AND IRRIGATION

One of the most hopeful of recent signs was the mandate appointing Mr. Chang Chien head of a National Conservancy Bureau. This body is to control the Hwai River and all conservation and irrigation schemes, except those already provided for by the Whangpoo and Haiho Conservancy Boards. It is understood that Mr. Chang Chien has in view a most comprehensive scheme for the betterment of the condition of the waterways of China, and that work on an extensive scale will be begun directly money becomes available.

While progress in railway construction is of the very first importance to the well being of China, the means of communication provided by her innumerable waterways should be recognised as of great value. For centuries the bulk of the internal trade was floated on the bosom of the waters, natural or designed, and the canal system of China has evoked wonder and praise from the Westerner. But neglect and corruption have largely impaired the value of the waterways. What used to be the besetting sin of China, the diversion of money intended for public purpose to private pockets, has led to the impairment of such magnificent and useful works as the Grand Canal.

The expenditure of great sums on the dredging and other material required and in labour, will be one of the most lucrative investments China will ever have made. In fact the provision of labour in the districts which suffer so regularly from floods and famines should properly be regarded as one of the most insistent duties of the Government. In all the circumstances, the Government is to be congratulated upon the establishment of the Bureau, and we have no doubt that under the able direction of Mr. Chang Chien, with expert foreign assistance, the waterways of China will become a gigantic factor in advancing the prosperity of the country.

CHINA'S RAILWAYS IN 1913.

The year 1913 will stand in China's railway history as the one of greatest advancement in the allotment of mileage and the extent of lines under construction since the first locomotive ran thirty-seven years ago with business intent on the Shanghai-Woosung railway,—a ten mile stretch, which was subsequently torn up and sent to Formosa by officials whose prejudice against steam traction was greater than their wisdom. The year that has just expired has seen approvals granted by the Government of the Republic for approximately 3,800 miles, a distance almost two-thirds as great as that of the railways that have been constructed and placed in operation since 1876, and work under construction to the extent of 2,600 miles. At the end of 1912 China had no more than 6,000 miles in operation with some 2,000 odd miles under construction. For a country with an area of 4,278,352 square miles (or, leaving out the dependencies, an area of 1,896,500 square miles for China Proper) and a population that is placed in round figures at 400,000,000, this is amazingly small and virtually insignificant when the vast areas under cultivation and the immense deposits of mineral wealth that await development are taken into consideration. But it looks as if the old days of violent opposition or passive resistance to modern progress have been left behind, and that men have come into power who realise the great and lasting value of rapid means of communication and mean to see their country profit by them. The activities in 1913 mark the turning point in Chinese opinion on the railway question, and 1914 can be looked to for startling advances along the line of providing for China a system which will permanently settle the burning question of the folly of haphazard construction, a question which has been thrashed threadbare by the ardent and active friends of the country. The Government lines in course of construction during the year were:

The Hukuang system	1,200 miles,	commenced.
Kalgan-Tatung railway	100 „	practically completed.
Lung-Tsing-U-Hai railway	1,500 „	commenced.

Total under construction, 2,800 miles.

In addition to these railways, desultory work has been carried on by the Company having the right of construction of the southern section of the Canton-Hankow line.

The new lines arranged for during the year are as follow:—

Tatung to Chengtu	1,200 miles.
Pukow to Sinyang	300 „
Shasi to Singyi	800 „
Taonanfu to Jehol and South Manchurian Railway feeders	1,200 „
Tsinanfu to Shunteh and Kaumi to Hanchwang	300 „
Total	3,800 miles.

NEW GERMAN RAILWAYS IN CHINA

On December 30 an agreement was signed at Peking by the representatives of the Republic of China and the German Minister in regard to important lines connecting with the Tsingtao-Tsinanfu Railway. One of these will run from Kaumi or Kaomi on the Tsingtao-Tsinanfu line to Ichowfu and thence on to Hanchuang, a station on the Tientsin-Pukow Railway on the Shantung border. The second line is an extension from Tsinanfu to some point on the Peking-Hankow line, to be decided upon after survey and investigation of the points most advantageous to railway building.

In an article on "Germany's Rights in Shantung," which appeared in the FAR EASTERN REVIEW in October last we foreshadowed the conclusion of this agreement. It was poined out in that article that a considerable amount of traffic would be diverted to Tsingtao. The line linking up a point near Shuntefu to Tsinanfu will also obviously be of great assistance in building up the trade of Tsingtao. The *Frankfurter Zeitung* on December 24 confirmed the forecast made in this paper that these lines are to be State-owned, but German capital and materials have to be employed in their construction and the Chief Engineer and the General Manager are to be German subjects. Our contemporary added that it is estimated that the capital required will be seventy to eighty million marks.

THE HANKOW-ICHANG RAILWAY

It is stated that it has been decided that the terminus of the Hankow-Ichang Railway will be at Hankow and not at Kwangshui on the Peking-Hankow line. It is possible that the route may run parallel with the Peking line as far as Siaokan. That question has yet to be decided. The engineers have not decided either where the railway is to cross the river Han. The route of the railway beyond Ichang is also undecided. Mr. Beckwith, the late chief engineer, recommended a new route, but he has now left the service, and the survey is in the hands of the new acting chief, Mr. Randolph, who was Mr. Beckwith's assistant.

AT THE END OF THE YEAR

By the time this issue is in the hands of readers the year 1913 will have passed into the limbo, and, it is to be hoped will have carried with it all the evil influences which are believed by the superstitious to be attached to the number 13. When 1913 dawned it threatened to be a deplorably bad year for China. The International bailiffs were alleged to have been waiting for a chance to slip into possession, and pessimistic publicists unreservedly proclaimed a declaration of bankruptcy to be inevitable. Terrible as have been the financial straits of the Government it has managed to weather the year, and the bailiffs are still without. How desperate the needs of the country have been, however, were disclosed in the Government's financial statements published in the last issue of the REVIEW, and it is regrettable to realise that the new year comes without any practical diminution of the difficulties. In fact they have been intensified by a fatuous rebellion which has brought incalculable misery to hundreds of thousands of people and added immensely to the obligations of the State. China staggers under a gradually swelling load of loans, and that burden will have to be increased before it can be lightened. Every provincial treasury is still in a state of poverty, and the Central Government scarcely knows where to turn to find the ready means necessary for administrative purposes and for the settlement of debts due to foreign lenders. What the actual claims against the Government are no-one can authoritatively say. In addition to foreign and domestic loans of which the public are aware, there are numerous short term obligations of indefinite amounts. The Government itself set down its requrements for 1913 as $646,350,000, while from October 1912 to June, 1914 a sum of about $216,000,000 was needed for the repayment of principal and interest of loans other than railway loans, $150,000,000 being for the repayment of long-period foreign loans and indemnities. The reorganisation loan of £25,000,000 provided the wherewithal to dispose of varied claims, but at the same time enhanced the difficulties of the country, as borrowing to repay borrowed money must always do, especially if adequate supplementary contributions are not being received from sources such as properly controlled and systematised provincial taxation.

From the end of 1911 to November 1913, the provinces contributed to the Central Government a paltry $2,600,000, but there seems a probability that 1914 will witness a marked change in this direction. The President has been able by the suppression of the rebellion to consolidate his power in the provinces, and if the statements which he has made from time to time since he found it necessary to deprive the Kuo Ming-tang members of their seats in Parliament are to be taken as a criterion he is genuinely desirous of lifting China from the slough in which it has been wallowing since the Revolution of 1911-12. He has been able to place men upon whom he can personally rely in command of the various provinces, and with a reorganisation which he declares he will inaugurate should come a proper collection of taxes and a steady flow of revenues into the treasury of the Central Government. Until revenues do come in, however, the Central Government cannot be said to be controlling the country, nor can any hopeful view be entertained that China will emerge from her financial entanglements with what are described as her "sovereign rights" intact and secure from the control of creditors who have loaned great sums to the Government and who are being called upon for still further assistance. Negotiations have been proceeding for some time with the representatives of the Quintuple Group for another large loan, but even if an agreement were negotiated forthwith the state of the money markets of Europe is likely to preclude any large flotation for months to come. This one fact may be a Heaven-sent boon to China, for she will be compelled to put her house in order if she is to stave off the overshadowing foreclosure which has been the cause of so much anxiety to those in whose hands the reins of government are for the time being resting.

In the statement of the Government's policy published in our last issue several proposals were outlined for raising additional revenue, and the one point that was emphasised was that no foreign loan should be floated for administrative expenses. How long this intention can be adhered to remains to be seen. To meet a deficit of some $70,000,000, and also to provide further funds for Treasury purposes, proposals for the imposition of new taxes, a reduction of administrative expenses, and the raising of a domestic loan were elaborated, and while the estimates under the heading of new taxation seem to many to be doubtful of realisation the Cabinet itself is convinced that the major part of the sum of $210,000,000, which they name as derivable from fresh taxation, can be secured. Mr. Liang Chi-chiao, who was largely instrumental in framing the General Policy, was able to reply to many critical questions in a distinctly optimistic vein. Any matters involving consideration of foreign interests, such as the proposed transit tax, would, he said, be discussed with the foreign elements concerned, and he had no doubt that all foreigners wishing well to China would assist her at this time by aiding in the rehabilitation of her finances. As for the proposed new taxes which would affect the people of China he felt that they would not be objected to, and that as soon as provincial officials loyal to the Central Government were installed they would be able to enforce whatever measures the Government might introduce. The Marriage Tax (estimated to yield $3,000,000) would be a nominal charge for a certificate; the Stamp Tax ($5,000,000) would be cheerfully paid as soon as it was understood; the Weights and Measures Tax ($20,000,000) had been tried in the three Eastern Provinces and would gradually be accepted in the other provinces, and as for the Income Tax ($10,000,000) it would mainly be collected from the salaries of officials by deduction. An interesting fact mentioned by Mr. Liang was that the Government intended to try to adopt the National Bank system of America in connection with which the Government proposed to make a strenuous effort to redeem the hundreds of thousands of depreciated bank notes either by retaining and destroying all notes paid in as taxes, by exchange of silver for notes at their market value, or by the outright purchase at a low rate with notes on the National Bank, branches of which institution would be established throughout the provinces with a head office in the capital.

The Maritime Customs

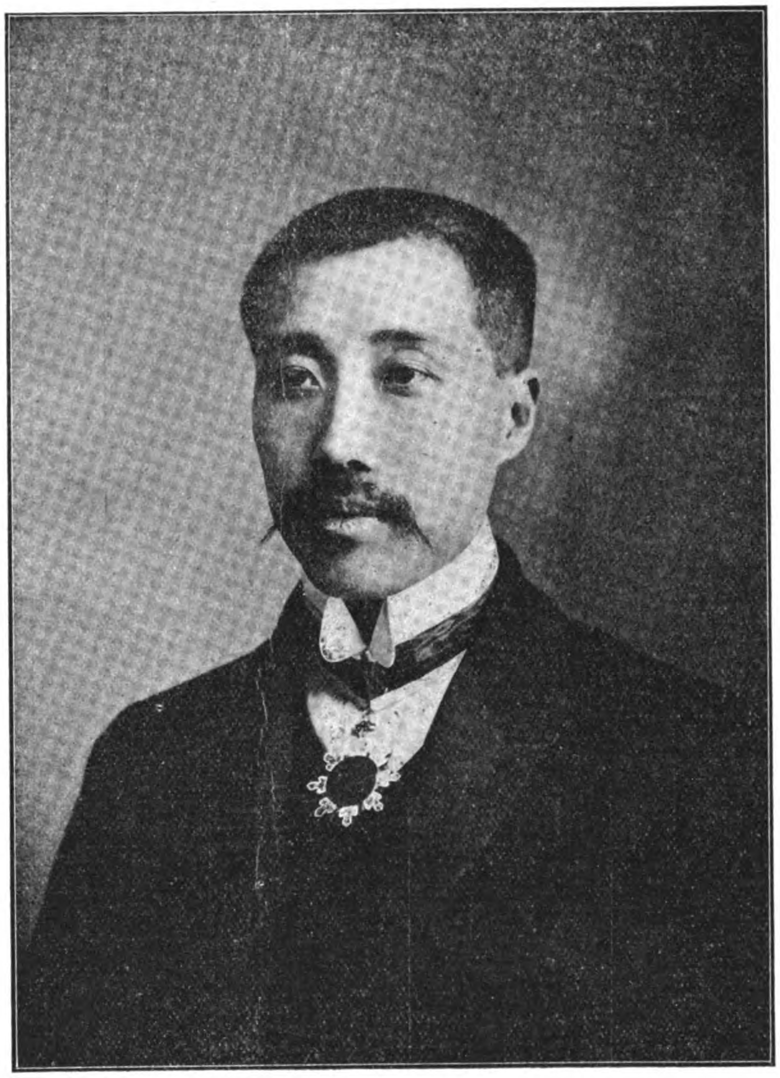
The Government has talked considerably of employing the best talent in the work of re-construction upon which it declares it has embarked, and evidence is awaited that this is being done. Whether or not proper foreign help will be enlisted is a moot point. It should be. The one bright spot in the financial gloom is the magnificent work done by foreigners in the Maritime Customs, and if the Chinese fail to awaken to the import of the lesson which the foreign control and administration of this splendid organisation teaches even their best friends must be driven to confess that there is no hope. Despite the travail through which the country has passed the Maritime Customs has been conducted in such a manner that its organisation has not become impaired in any way by local disturbances or conditions. Its collections in 1912 constituted a record. The year was one of grave concern to all commercial agencies, and politically there was chaos throughout the length and breadth of the land. And yet the Customs collected Haikwan (Customs) Taels 39,970,000, an increase over the previous best year of Tls. 3,800,000. That highly satisfactory result was a surprise to all who felt the acute pinch due to commercial dislocation, but it was a remarkable testimony to the vitality of China. It demonstrated beyond cavil that in the face of internal turmoil foreign trade flowed steadily and that carefully regulated safeguards over the revenues collected ensured their passage along the proper channels for full use in the interests of China. A similar story is repeated this year. There has been another outbreak of a serious kind; trade has received no encouragement such as can be expected from peaceful times, and, yet, the collections by the Customs are greater even than last year. The returns telegraphed to the Inspector-General at Peking show that a total of Tls. 43,960,000 (or at exchange 3/0⅝ = £6,708,479) were collected, being an increase of Tls. 4,000,000 over that of 1912. In the two years of the Republic the revenue from the customs has thus increased by more than Tls. 7,500,000. This year they have

been sufficient to meet the payment of all loans for which they are security, as well as the entire Boxer Indemnity charge for the year 1913.

This result eloquently speaks of the great possibilities for economic development which reasonable peace and even a modicum of progress in internal organisation would secure. The history of the Customs proves merely that honesty is the best policy for a State as it is for a man. There has been a steady increase in foreign trade, and the country has received the benefits from it by proper safeguards being placed upon collections. And the country will receive the benefit from all expansion so far as the Customs are concerned, a benefit which will be somewhat enhanced if the tariff is made, as is being requested by China, an effective five per cent. But the point is that China could, if she would, apply a system to other affairs similar to that which has made the Customs the splendid service it is. On the authority of one who is competent to speak from knowledge of China's conditions foreign administration is not needed so much as foreign assistance. In the salt and other revenue-producing services adequate account keeping, publicity of returns, and foreign guidance in various centres is all that is required. Revenues would thus be diverted from the pockets of people unentitled to them to the coffers of the State. The experience of the Customs is that control of receipts is the chief requisite. The system of administration of most of China's revenue collecting services is virtually effective enough. Administration by foreigners is not necessary. Assistance to systematise and check receipts are the primary needs, and by adopting these China could quickly demonstrate her ability to pay her debts and be independent of foreign loans for general administrative purposes.

The Salt Gabelle

To a large extent this is already being discovered in the Salt Gabelle. Collections from that potentially rich service had dwindled to a mere bagatelle so far as the state was concerned. As security for the Reorganisation Loan it was severely criticised as inadequate. Thousands of people unentitled to revenues were pocketing the receipts. The Central Government was getting virtually nothing. The advent, however, of Sir Richard Dane, as Adviser, combined with the appointment of Mr. Chang-hu as head of the Gabelle, has been responsible for striking results. Mr. Chang-hu has had ripe experience in China of the systems in vogue in several of the salt-producing districts, and Sir Richard Dane has had unique experience with the salt administration of India. Both brought to their task of reorganisation in China most excellent talent, and already the fruits of their efforts are being gathered by the country. As the salt revenue is the security for the Reorganisation Loan of £25,000,000 and other smaller obligations it is worthy of brief mention here what has been done during the past few months. In January last a Chief Inspectorate of Salt was established, consisting of one foreign and one Chinese Inspector-General and one Chinese and one foreign Deputy Inspector-General with staffs to carry out the routine work. The salt-producing districts in China were divided into ten, viz., Manchuria, Changlu, Shantung, Liang-hwai, Liang-chi, Fukien, Kwangtung, Szechuan, Ho-tung (Shansi) and Yunnan, and at each district head office a district inspectorate is to be established with one Chinese inspector and one foreign co-inspector in charge of the working staff. In April last District Inspectorates were created for Manchuria, Changlu, Shantung, Liang-hwai, Liang-chi and Fukien, and later on similar organisations were opened in Kwangtung and Ho-tung districts, while Yunnan and Szechuan are now in course of establishment. The various inspectorates which have taken up their duties have entered into the very difficult work of straightening out an almost impossible entanglement in which the rights of the Government have been lost to view by many individuals whose chief idea of salt gabelle revenue is that it has been forgotten by the Government and therefore may be collected and utilised for their special benefit. This is one of the grave evils of the Revolution, and to compel the voluntary rendering unto Cæsar that which belongs to Cæsar is the chief difficulty of the Central Government at the moment. But it is gradually being done, and the various inspectors deserve every credit for diverting the flow of revenue—if only partly from illegitimate courses into the proper channels. Substantial collections have been made. Each inspectorate is held responsible for the revenue. They are to collect taxes, make deposits and proper disbursements, audit and report the accounts and make up statistics. Since May 21 last, on which date the Quintuple Loan bonds (which are secured upon salt revenues) were first issued the Government has done much to improve the organisation, and substantial revenues have been deposited in the various banks in accordance with loan agreement. Between May 21 and the end of September Taels 3,423,000 and Mex. $9,447,000 were collected, and on December 18 the total holdings by Group banks was approximately Taels 4,370,000. This result must be regarded as highly satisfactory when it is remembered that reforms have not yet been thoroughly introduced. Sir Richard Dane has travelled and reported upon the Manchurian, Shantung and Chang-lu salt administrations, and will act similarly with the others. Insofar as actual reform of taxation is concerned it will be gradually introduced, the system to be adopted being collection of taxes at the salt-producing districts. This system will be introduced at Changlu, and to facilitate matters the salt-producing and salt-consuming sections of the country will be converted into two divisions. The first division will comprise the salt-producing districts of Fengtien, Chihli, Shantung, Shansi, Kansu, Shensi and Hwaipei in Kiangsu, and the salt-consuming districts of Kirin, Hei-lung-kiang, Honan and northern Anhui; and the second division will be the salt-producing districts of Hwainan in Kiangsu, Liang-cheh, Fukien, Kwantung, Szechuan and Yunnan, and the salt-consuming districts of southern Anhui, Kiangsi, Hupeh, Hunan, Kwangsi, and Kweichow. The old system of tax collection will be continued in the second division until July next, the tax imposed being $2.50 on every hundred catties of salt, but in the first



MR. CHANG-WU, Head of the Salt Gabelle and Vice-Minister of Finance. A short reference to his official career appears elsewhere.

division it will be $2 per hundred catties. The collection of the tax shall be completed in one payment at the place of production without regard to the destination to which the salt is transported, and no further taxes shall be levied. For the purposes of taxation scales, weights and measures are to be standardised, but pending their promulgation, the "Ssuma" scales will be used. By these scales 16.8 ling equal one catty; 100 catties equal one picul, and 16 piculs equal one English ton. The provisions of the regulations briefly referred to above are to be carried into effect in all the provinces of China in which salt is produced or consumed, excepting Mongolia, Chinghai, Sinkiang (New Dominion), Tibet and Leased Territories, which are considered as special districts. The activities along reform lines are distinctly encouraging and indicate that the Government is earnest in its efforts to place this valuable source of revenue upon a sound foundation, and now that the President is centralising the power of the Government there is every reason to suppose that progress will be real if political factions can be persuaded that what is being done is for the best interests of the people.

It is of interest to note that at the end of the year $9,000,000 from salt revenue had been lodged in the Group banks, $1,000,000 of which came from Kwangtung province.

"STARVING CHINA'S RAILWAYS"

The following is a free translation of a letter that we have received from the Premier, Mr. Hsiung Hsi-ling:—

In the FAR EASTERN REVIEW recently appeared an article criticising the administration of the Chinese Government Railways. This article had special relation to the provision of additional rolling stock. The Government recognises that the extension of all railway traffic depends mostly upon the provision of sufficient cars; that may be termed a a fundamental requirement.

Of late in regard to any application for the provision of extra cars the Government has done its best to comply therewith except when the request has come at a time of financial stress.

Since the establishment of the present Ministry the revenue raised from the different railways during the first and second years of the Republic for the purchase of extra cars has amounted to over $15,000,000, which is double that raised in the time of the Yen Chuan-pu; still there appears to be an insufficient number of cars to meet the requirements of the traffic. The reasons for this are:—

(1). The lines are constantly being extended and the cars cannot keep pace with this growth.

(2). The transport of soldiers and military supplies occasions delays to ordinary merchandise.

It is impossible at present to devote more money than is being allotted as shown above for the purchase of additional cars, as otherwise it would be difficult to make the necessary repayments of interest and capital on foreign and domestic railway loans. Other departments are in need of money, and if additional amounts were demanded for purchase of cars difficulties would be created.

The FAR EASTERN REVIEW also suggested that the Government relied wholly on the revenue from the various railways under the Board of Communications for revenue for general purposes. This is not so, although the Government was sometimes in need of railway revenues for other purposes. The Ministry of Finance does not help the Board of Communications to the extent of one cash; how then can the Board get money to meet other demands than those for railway requirements?

Table showing the extra purchases of cars by the Government Railways for 1st and 2nd Year of the Republic:

	1st year	2nd year
Peking-Mukden Railway	$ 787,540	$ 670,000
Peking-Hankow	$4,082,300	$1,570,303
Tientsin-Pukow	$1,767,070	$ 158,100
Cheng-Tai	$ 340,000	$ 600,000
Tao-Tsiu	$ 26,061	$ 168,000
Kuang-Chu	$ 503,700	$ 508,241
Chi-Shang	$ 818,667	$ 465,400
Chu-Ping	$ 120,000	$ 42,000
Peking-Kalgan	$1,150,000	$ 540,000
Shanghai-Nanking	......	$ 978,800
Grand Total		$15,294,182

JAPAN'S MACHINERY IMPORTS

The U. S. Consul-General at Yokohama, Mr. Thomas Sammons, writes in *Daily Consular and Trade Reports*:—

Japan is buying a steadily increasing amount of foreign machinery and engines, the total purchases for 1912 aggregating $14,175,689.

During the past three years the sale of products of this kind that were manufactured in the United States nearly doubled, the increase in 1911 over 1910 being upward of $1,300,000. Nevertheless, it is well known among the expert representatives of the various competing countries that in some lines—particularly in cement and paper-making machinery—European manufacturers have of late been securing orders that were actively solicited by American concerns. In other lines, however, the American manufacturers have steadily increased their exports thither, as is shown by the fact that their total sales to Japan in 1912 amounted to $3,442,324, as compared with $3,144,499 in 1911.

TOTAL IMPORTS—TRADE IN DYNAMOS AND MOTORS

The total importations of machinery and engines into Japan for 1910, 1911, and 1912 may be summarized as follows:—

Imported from	1910	1911	1912
United States	$1,807,667	$3,144,499	$3,442,324
Belgium	41,414	43,117	66,533
Germany	1,150,906	3,289,326	3,214,779
Great Britain	4,656,470	6,193,616	7,104,011
Other countries	172,688	312,428	348,342
Total	7,838,145	12,982,986	14,175,989

Of dynamos, motors, and transformers nearly 50 per cent. of Japan's total imports in 1912 came from the United States. The competition in this particular line has been decidedly brisk, a summary of the results for three years being as follows:

Imported from	1910	1911	1912
United States	$449,256	$901,974	$712,060
Germany	315,932	1,372,046	535,893
Great Britain	304,236	538,219	338,164
Other countries	22,153	31,937	6,763
Total	1,091,577	2,844,176	1,592,880

TURBINES, ETC.—SEWING MACHINES

The total imports of metal and wood working machinery into Japan reached nearly $2,000,000 in 1912, Great Britain leading with $1,117,421, the United States coming next with $519,163, and Germany being represented by $307,676. The bulk of the spinning machinery used in Japan continues to come from England ($702,423 out of a total of $897,672), although American manufacturers are increasing their sales. Germany has a large share of the water turbine and Pelton wheel trade in Japan, the steam turbine business being divided between the United States, England, and Germany. Of Japan's pump imports during 1912 England supplied $176,229 worth, the United States $80,208, and Germany $67,952.

Of a total of $602,782, representing Japan's purchases of foreign sewing machines, the United States is credited with $458,298, British America (also representing American interests) $105,903, Great Britain $26,589, and Germany $10,216. German sewing machines, even though cheap, are not proving satisfactory in Japan, and the trade has steadily declined during the past few years. At the same time American manufacturers, with up-to-date American representation on the spot, have increased their sales from $160,126 in 1910 to $458,298 in 1912. Japan's imports of sewing machines for the last three years were as follows:

Imported from	1910	1911	1912
United States	$160,126	$410,334	$458,298
Great Britain	9,171	24,591	26,589
Germany	31,507	23,326	10,216
British America	......	62,981	105,903
Others	37,495	939	1,776
Total	238,299	522,171	602,782

OTHER ARTICLES THAT FIND A MARKET

Other articles in the machinery, engine, and boiler class that find a market in Japan, together with the total imports during 1912, are: Steam boilers, $585,008; blowing machinery, $233,497; cranes, $452,866; dynamos, combined with motive machinery, $469,161; gas and oil engines, $602,319; steam engines, $179,021; gas compressors, $212,525; locomotives $399,158; paper-making machinery, $67,759; tissue finishing machinery, $161,011; weaving machinery, $273,024; portable steam engines and road rollers $16,000; blocks, and chain blocks, $48,000; diving apparatus, $12,000; hydraulic presses, $45,000; knitting machines, $34,000; dyeing and bleaching machines, $3,400; sugarmaking machines, $4,300; ice-making machines, $65,000; printing machines, $33,000.

In many instances the Japanese are themselves manufacturing machinery, and to that end considerable quantities of machine tools and appliances are being imported.

The Russian Government has granted to Vickers, Limited, in conjunction with the leading banks of St. Petersburg, a concession for the establishment of extensive new gun works at Tsaritsyn, on the banks of the Volga. Orders to the value of about £1,000,000 have already been received.

CHINA'S RAILWAY BUDGET

ESTIMATES FOR THE YEAR BEGINNING JULY, 1913, AND ENDING JUNE, 1914

The following is a translation of the Budget for the railways under the control of the Government of the Republic of China for the year beginning with July, 1913, and ending with June, 1914. The document was prepared by the Railway Bureau of the Board of Posts and Communications:—

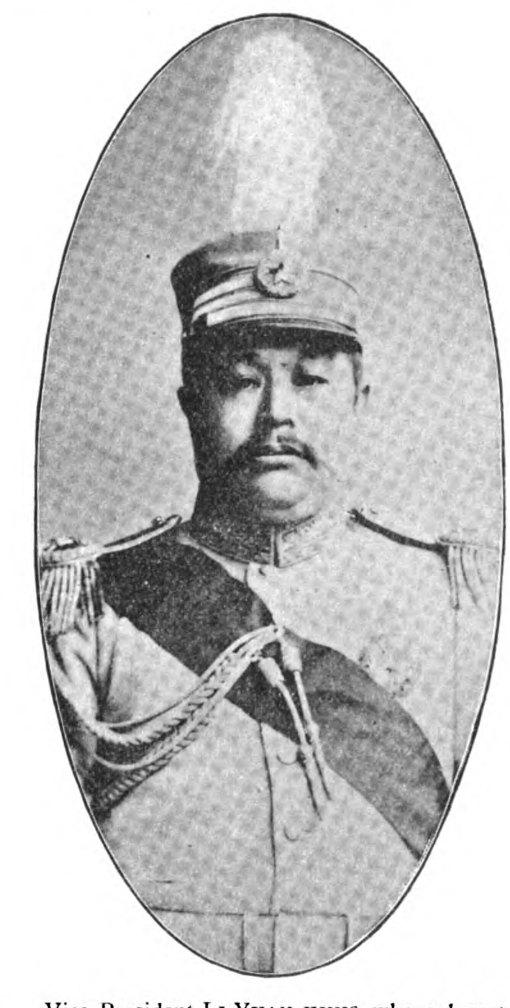
The system of railways at present under the control of the Government were constructed mainly with the aid of foreign loans contracted during the Ching Dynasty. In accordance with the agreements under which the loan monies were obtained the supervision of construction, traffic, and accounting have been in the hands of foreigners, and the Government has, therefore, not been able fully to exercise its rights—and will be unable to do so until the loans are paid off. Difficulties have consequently been great in the preparation of a budget, and we feel that the present one is not so satisfactory as it might otherwise have been. Uniformity in data secured has been impossible owing to the fact that a different system of accounts exists on every railway, but prior to the compilation of this budget temporary uniformity was attempted by the despatch of forms to the various railways to be filled in. Though that design appeared to be desirable it did not meet with approval in all quarters.

This Budget has been made up from the figures of the previous year. While formerly the remittances made to the Ministry of Communications by various railways were devoted to the purposes of the railways so contributing, they have of late been utilised by the Ministry for the maintenance of the whole Board. Under the heading of Traffic there appears an increase. As funds for the administration of the various railways have been provided for in the various agreements they have been entered under the heading of traffic expenditure. Likewise the funds necessary for the maintenance of students and railway schools are entered under the same heading. Most of the materials for railway construction have been purchased from foreign countries, the lack of development of Chinese industries preventing purchases being made to any great extent in this country.

Under the heading of Traffic the receipts from the various railways are estimated at $45,258,541, and the expenditure is estimated at $34,355,052, showing an estimated surplus of $10,933,489, which, in comparison with the previous year (July, 1912, to June, 1913) is an increase of about $6,600,000

The newly-opened Tientsin-Pukow railway showed a deficit of $1,930,000 for the previous year, but it is estimated that there will be a surplus of $8,000,000 for the year under consideration.

Under the heading of Capital the total receipts are estimated at $1,938,920, while the expenditure is placed at $22,146,622. The Shanghai-Nanking railway is not considered in this item. There is a deficiency of $20,203,702, but that includes the repayment of something over $4,020,000 on behalf of the Peking-Mukden, Peking-Hankow, and Shansi railway loans; construction expenses of more than $2,700,000 for the Kalgan-Sui-yuan extension; and expenses of over $3,680,000 for completion of work on the Tientsin-Pukow and Kirin-Changchun lines. The remaining $10,000,000 will be devoted to the extension of construction work on branches, the building of cars and the purchase of railway materials.



Vice-President LI YUAN-HUNG, whose departure from Wuchang to Peking was regarded as one of the most significant events that occurred during December. His departure from Wuchang was held to indicate a belief that the "strong hand" was no longer required there, and that the rumours of friction between him and President Yuan Shih-kai were without foundation.

As figures in connection with the various railways are calculated mostly in pounds sterling or francs it is impossible, owing to variations in exchange, to make the figures tally with the actual ones. Following are the estimates for the various railways:—

ESTIMATED TRAFFIC RECEIPTS

Ching-Feng	Line	(Peking-Mukden)	$ 12,180,000
Ching-Han	„	(Peking-Hankow)	15,651,200
Ching-Pu	„	(Tientsin-Pukow)	7,349,140
Cheng-Tai	„	(Shih Chia-chuang to Taiyuanfu)	2,434,000
Tao-Ching	„	(Taokow-Chinghua)	563,100
Hu-Ning	„	(Shanghai-Nanking)	3,025,000
Kuang-Chiu	„	(Canton-Kowloon)	724,000
Chi-Chang	„	(Kirin-Changchun)	506,339
Chu-Ping	„	(Chuchow-Pinghsiang)	579,230
Ching-Chang	Line	(Peking-Kalgan)	$1,858,121
Chang-Sui	„	(Kalgan-Suiyuan)	388,411
		Total	$ 45,258,541

ESTIMATED TRAFFIC EXPENDITURE.

Ching-Feng	Line	(Peking-Mukden)	$5,743,652
Ching-Han	„	(Peking-Hankow)	8,350,768
Ching-Pu	„	(Tientsin-Pukow)	9,286,409
Cheng-Tai	„	(Shansi)	1,821,750
Tao-Ching	„	(Taokow-Chinghua)	811,830
Hu-Ning	„	(Shanghai-Nanking)	3,486,000
Kuang-Chiu	Line	(Canton-Kowloon)	1,629,131
Chi-Chang	Line	(Kirin-Changchun)	103,033
Chu-Ping	Line	(Chuchow-Pinghsiang)	421,353
Ching-Chang	Line	(Peking-Kalgan)	1,088,840
Chang-Sui	Line	(Kalgan-Suiyuan)	349,757
		Total	$ 34,072,523

EXTRAORDINARY TRAFFIC EXPENDITURE.

Ching-Feng	Line (Peking-Mukden)	$ 137,029
Kuang-Chiu	Line (Canton-Kowloon)	3,500
Ching-Chang	Line (Peking-Kalgan)	62,000
Chang-Sui	Line (Kalgan-Suiyuan)	50,000
	Total	$ 252,529

The difference between the Traffic Receipts and Expenditure shows a surplus of $10,933,489.

EXTRAORDINARY CAPITAL RECEIPTS

Ching-Feng	Line (Peking-Mukden)	$ 20,000
Ching-Han	Line (Peking-Hankow)	21,000
Ching-Pu	Line (Tientsin-Pukow)	520
Hu-Ning	Line (Shanghai-Nanking)	1,390,000
Kuang-Chiu	Line (Canton-Kowloon)	500,000
Chu-Ping	Line (Chuchow-Pinghsiang)	7,400
	Total	$ 1,938,920

ANNUAL CAPITAL EXPENDITURE.

Ching-Feng	Line (Peking-Mukden)	$ 670,000
Ching-Han	Line (Peking-Hankow)	2,870,000
Cheng-Tai	Line (Shansi)	483,000
	Total	$ 4,023,000

ANNUAL EXTRAORDINARY CAPITAL EXPENDITURE

Ching-Feng	Line	(Peking-Mukden)	$ 1,309,280
Ching-Han	„	(Peking-Hankow)	6,833,252
Ching-Pu	„	(Tientsin-Pukow)	2,494,950
Cheng-Tai	„	(Shansi)	810,210
Tao-Ching	„	(Taokow-Chinghua)	186,000
Hu-Ning	„	(Shanghai-Nanking)	1,153,400
Kuang-Chiu	„	(Canton-Kowloon)	562,041
Chi-Chang	„	(Kirin-Chanchun)	1,190,700
Chu-Ping	„	(Chuchow-Pinghsiang)	224,000
Ching-Chang	„	(Peking-Kalgan)	662,068
Chang-Sui	„	(Kalgan-Suiyuan)	2,702,721
		Total	$ 18,128,622

The difference between Capital Receipts and Expenditures shows a deficit of $20,212,702.

July 2nd year to June 3rd year

BUDGET ON TRAFFIC AND CAPITAL OF THE GOVERNMENT RAILWAYS

(showing their profit and loss).

Names of Lines	Traffic		Capital		Traffic and Capital	
	Profit	Loss	Profit	Loss	Profit	Loss
Ching-Feng	$6.299,319			$1,959,280	$4,340,039	
Ching-Han	$7,300,432			9,682,252		$2,381,820
Ching-Pu		$1,937,269		2,494,430		4,431,699
Cheng-Tai	612,250			1,293,210		680,960
Tao-Ching		248,730		186,000		434,730
Hu-Ning		461,000	$236,600			224,400
Kuang-Chiu		908,631		62,041		970,672
Chi-Chang		596,694		290,700		1,787,394
Chu-Ping	177,877			216,600		38,723
Ching-Chang	707.281			662,068	45,213	
Chang-Sui		11,346		2,702,721		2,714,067
Total	$15,097,159	$4,163,670	$236,600	$20,449,302	$4,385.252	$13,664,465
Comparison with 1912-13	$10,933,489			$20,212,702		$9,279,212

PEKING-MUKDEN RAILWAY

The actual expenditure during the previous three years is taken as a basis. In this budget the estimated receipts under the heading of Traffic is $10,180,000, a decrease when compared with the previous year. The ordinary and extraordinary expenditure under Traffic are estimated to amount to a little over $5,880,000. This includes $4,440,000 under the headings of General, Traffic, Shop-working and Maintenance, which in comparison with the previous year shows an excess of $70,000, due to the fact that costs of materials to be purchased have been fixed on a very conservative basis, owing to the gradual rise of prices. Extraordinary expenditure is estimated at $137,029, which is to be devoted solely to workshop and maintenance purposes.

Estimated receipts and expenditure show a profit of a little over $4,290,000, of which $1,950,000 is estimated as Capital expenditure.

Owing to financial stringency restrictions in the way of furnishing rolling stock and expenditure on workshops and maintenance have been compulsory. We have been compelled to leave out of consideration in this budget any matters that might be postponed. With regard to rolling stock, however, it is impossible to delay further, and the cost will be spread over several years. A sum of $1,130,000 has been estimated for rolling stock and engineering purposes, and $670,000 will go to the repayment of loans.

Expenditure on maintenance is fixed at about $100,000.

DETAILS OF ESTIMATED TRAFFIC RECEIPTS.

1. Coaching	Total	$ 12,000,000
(a) Passengers		5,400,000
(b) Freight		6,600,000
2. Miscellaneous	Total	$ 180,000
(a) Rental		150,000
(b) Interest		20,000
(c) Miscellaneous		10,000

DETAILS OF ESTIMATED TRAFFIC EXPENDITURE

1. General	Total	$ 833,710
(a) Salaries or wages		429,800
(b) Running expenses		120,000
(c) Miscellaneous		283,910
2. Traffic	Total	$ 680,000
(a) Salaries or wages		546,000
(b) Running expenses		72,000
(c) Miscellaneous		62,000
3. Workshop	Total	$ 1,823,400
(a) Salaries or wages		308,000
(b) Running expenses		657,700
(c) Maintenance		802,700
(d) Miscellaneous		55,000
4. General Maintenance	Total	$ 1,103,742
(a) Salaries or wages		178,110
(b) Running Expenses		7,350
(c) Maintenance		847,577
(d) Miscellaneous		70,705
5. Interest on Loans.	Total	$ 1,118,000
(a) British and Chinese Corporation	24th, 25th	$1,100,000
(b) South Manchuria Railway	6th, 7th	18,000
6. Running Expenses for the Ministry of Communications	Total	$ 67,200
7. Educational Fee for Students abroad.	Total	$ 117,600
(a) European and American Students		42,000
(b) Tang-Shan Railway and Mining Institution		75,600

The total expenditure under Traffic is estimated at $5,743,652

DETAILS OF ESTIMATED EXTRAORDINARY EXPENDITURE

	Total	$137,029
(a) Workshop		$ 57,000
(b) Maintenance		80,029

The grand total of estimated traffic expenditure, reaches $5,880,681

The difference between the estimated Receipts and Expenditure on traffic shows a profit of $6,299,319

DETAILS OF ESTIMATED EXTRAORDINARY CAPITAL RECEIPTS

1. Sale of Waste or useless stuff Total $ 20,000

DETAILS OF ESTIMATED CAPITAL EXPENDITURE

1. Repayment of Loans	Total	$ 670,000
(a) British and Chinese Corporation, 9th		650,000
(b) South Manchuria Railway Co., 6th and 7th		20,000

DETAILS OF EXTRAORDINARY CAPITAL EXPENDITURE

1. Car Buildings	Total	$ 670,010
(a) Locomotives		181,210
(b) Passenger Cars		143,000
(c) Goods wagons		345,800
2. Machinery supplies	Total	$ 81,300
(a) Tang-shan Workshop		68,400
(b) Maintaining Department		1,200
(c) Telegraphic „		11,700
3. Extension of Engineering work.		
(a) Engineering work for internal sections		156,480
(b) Engineering work for external sections		52,850
(c) Engineering work for eastern sections of Feng-Tien		98,640
(d) Removing the city wall at Cheng-Yang-Mong and filling up the moat thereabout		250,000

The estimated extraordinary Capital expenditure totals $1.309,280. The grand total reaches $1,979,280. The difference between the annual Capital Receipts and Expenditure shows a deficiency of $1,959,280.

PEKING-HANKOW RAILWAY

Traffic receipts are estimated at $15,651,200 which, in comparison with the previous year, will give a surplus of $3,000,000.

Expenditure is estimated at $8.350.768 and exceeds that of the previous year under "General Expenses" by $70,000, "Traffic Expenses" by $100,000 and "Maintenance Expenses" by $200,000.

Extraordinary Capital expenditure is estimated at $6,800,000. As we have to make the railway prosperous we have to make ample provision for operating expenses.

The estimates of receipts and expenditure shows a profit of $7,300,432.

ESTIMATED TRAFFIC RECEIPTS

1. Coaching receipts	Total	$ 15,332,750
(a) Passengers		3,636,750
(b) freight		11,696,000
2. Miscellaneous receipts	Total	$ 318,450
(a) Rental		263,680
(b) Interest		25,000
(c) Miscellaneous		29,770
The total amounts to		15,651,200

ESTIMATED TRAFFIC EXPENDITURE

1. General expenses	Total	$ 605,486
(a) Salaries or wages		360,580
(b) Running expenses		64,586
(c) Miscellaneous		180,320
2. Traffic expenses	Total	$ 891,872
(a) Salaries or wages		497,040
(b) Running expenses		154,530
(c) Miscellaneous		240,302
3. Workshop expenses		1,613,010
(a) Salaries or wages		252,360
(b) Running expenses		627,780
(c) Reserve expenses		672,120
(d) Miscellaneous		60,750
4. Maintaining expenses		1,643,400
(a) Salaries or wages		516,000
(b) Running expenses		14,400
(c) Reserve expenses		994,800
(d) Miscellaneous		118,200
5. Interest on domestic and foreign loans		3,478,400
(a) Hongkong Shanghai, and French banks		2,563,000
(b) Interest on loan from the Ministry of Communications for the redemption of the railway		411,000
(c) Interest on Szechuan-Hankow Railway loan		102,900

According to the agreement the repayment of the capital shall be commenced in 1912, but owing to financial stringency, that cannot be done.

(d) Interest on domestic loan	401,500
6. Contribution for the Ministry of Communications	67,200
7. Contribution for students abroad	51,400
(a) For European students	42,800
(b) For students in other countries	8,600

The above-stated estimated expenditure totals $8,350,768.

ESTIMATED EXTRAORDINARY CAPITAL RECEIPTS

1. Waste material sold 21,000

ESTIMATED CAPITAL EXPENDITURE

1. Repayment of loans 2,870,000
(a) Repayment to the Ministry of Communications of the loan for the redemption of this railway 1,370,000
(b) Due Repayments for the previous two terms of the loan made from the Ministry for the redemption of this railway amounting to $2,740,000 have not been made on account of financial stringency. These two repayments are still to remain in this term, so they are not entered or fixed under the heading of Capital Annual expenditure of this budget.
(c) Repayment of Szechuan-Hankow Railway loan $1,500,000

The above-stated estimated Capital expenditure totals $2,870,000

MR. LIANG CHI-CHAO, Minister of Justice, who prepared the comprehensive statement of China's policy which appeared in the November issue of the FAR EASTERN REVIEW

ESTIMATED EXTRAORDINARY CAPITAL EXPENDITURE

1. Addition of Rolling Stock	$ 1,510,302
(a) Locomotives	108,300
(b) Passenger and Service Cars	378,950
(c) Goods wagons	1,023,053
2. Machinery supplies	923,233
(a) Traffic Dipartment	46,725
(b) Workshop	178,600
(c) Maintenance Department	86,950
(d) Balance due on machinery supplies ordered in 1912, amounting to	615,958
3. Extension of engineering works	2,164,699
(a) General office	17,500
(b) Traffic Department	670,005
(c) Workshop	97,544
(d) Maintenance Department	129,650
(e) Pulling down the city wall at Ching-Yang-Mong, and filling up the moat thereabout	250,000
(f) Precaution expenses for the Huang-ho (Yellow River) bridge	1,000,000
4. Branch Construction	2,100,000
(a) Projected line between Chowkiahow and Yea-chen	1,750,000
(b) Projected line between Chang-Sin-Tien and Ta-Whe-chuang	350,000
5. Balance due on land purchased at Hupeh	122,017
6. Customs duties on railway materials	8,000

The total of estimated extraordinary expenditure is $6,833,252.

The grand total of the estimated expenditure under the heading of capital is $9,703,252.

The difference between the estimated receipts and expenditure on capital gives a deficit of $9,682,252

TIENTSIN-PUKOW RAILWAY.

ESTIMATED TRAFFIC RECEIPTS

1. Coaching	Total	$ 7,177,780
(a) Passenger Cars		3,186,620
(b) Goods "		3,991,260
2. Miscellaneous	Total	$ 171,260
(a) Rental		25,087
(b) Interest		Nil
(c) Miscellaneous		146,173

The total traffic receipts is estimated at $ 7,349,140

ESTIMATED TRAFFIC EXPENDITURE

1. General expenses	Total	$ 1,127,543
(a) Salaries or wages		688,633
(b) Running expenses		114,048
(c) Miscellaneous		324,862
2. Traffic expenses	Total	$ 638,325
(a) Salaries or wages		474,191
(b) Running expenses		92,014
(c) Miscellaneous		72,120
3. Workshop	Total	$ 1,671,094
(a) Salaries or wages		294,604
(b) Running expenses		664,322
(c) Reserve expenses		660,268
4. Maintenance expenses	Total	$ 1,089,977
(a) Salaries or wages		458,944
(b) Running expenses		30,220
(c) Reserve expenses		582,275
(d) Miscellaneous		18,538
5. Interest on Loan	Total	$ 4,699,470
(a) German-Chinese Bank		3,225,000
(b) Chinese Central Rail-Co.		1,474,470
6. Contribution for the Ministry way of Communications	Total	$ 60,000

The total amount estmated for traffic expenditure is $9,286,409.

The difference between the estimated traffic receipts and expenditure shows a deficit of $1,937,269.

ESTIMATED EXTRAORDINARY CAPITAL RECEIPTS

1. Sale of iron and wooden oil barrels. $ 520

ESTIMATED EXTRAORDINARY CAPITAL EXPENDITURE

1. Increase of Rolling Stock.	Total	$ 958,100
(a) Locomotives		300,000
(b) Passenger Cars		312,000
(c) Goods wagons		262,500
(d) Increase of rolling stock for the southern Section		83,600
2. Machinery Supplies	Total	$ 16,000
(a) Machine tools for engine-repairing purpose for Tsenan Workshop		5,000
(b) Machine tools for Locomotives and Passenger and Goods wagons for the Southern Section		11,000
3. Construction work	Total	$ 1,520,850
(a) Tsinan-fu and Pukow		1,440,850
(b) Along the whole line		80,000

The above-quoted extraordinary capital expenditure amounts to $2,494,950.

The difference between estimated Receipts and Expenditure on capital shows a deficit of $2,494,430.

Explanation.—1. The construction work of this line has just been completed. The unification of the northern and southern sections has now been completed, but it is impossible to estimate receipts, except on the basis of the present current receipts.

2. Since traffic has only recently been opened on the whole line, the estimate of expenditure is approximate.

SHANSI (CHENG-TAI) RAILWAY

Estimated Traffic Receipts

1. Coaching	Total	$ 2,400,000
(a) Passengers		500,000
(b) Freight		1,900,000
2. Miscellaneous	Total	$ 34,000
(a) Rental		26,000
(b) Interest		4,500
(c) Miscellaneous		3,500
The total amounts to $2,434,000		

Estimated Traffic Expenditure

1. General expenses	Total	$ 186,900
(a) Salaries or wages		134,700
(b) Running expenses		33,900
(c) Miscellaneous		18,300
2. Traffic Expenses	Total	$ 156,300
(a) Salaries or wages		126,500
(b) Running expenses		11,200
(c) Miscellaneous		18,600
3. Workshop expenses	Total	$ 397,550
(a) Salaries or wages		120,700
(b) Running expenses		140,350
(c) Reserve expenses		117,200
(d) Miscellaneous		19,300
4. Maintenance expenses	Total	$ 255,700
(a) Salaries or wages		166,000
(b) Running Expenses		1,700
(c) Reserve expenses		112,500
(d) Miscellaneous		15,500
5. Interest on Loans	Total	$ 800,000
6. Contribution for the Ministry of Communications	Total	$ 20,160
7. Contribution for support of Students	Total	$ 5,140
(a) Students abroad		3,140
(b) Railway school		2,000
The above-quoted Expenditure totals		$1,821,750
The difference between receipts and expenditure shows a profit of		$612,250

Estimated Capital Expenditure

1. Repayment of Loan	Total	$ 483,000

Estimated Extraordinary Capital Expenditure

1. Increase of Rolling Stock	Total	$ 600,000
(a) Locomotives		250,000
(b) Passenger cars		Nil.
(c) Goods wagons		350,000
2. Increase of Machinary Supplies	Total	$ 125,810
(a) (旋盤水磅)		13,400
(b) Rails		18,710
(c) Iron Pipes		3,700
(d) Store Materials		70,000
(e) Funds for precaution		20,000
3 Extension of construction work	Total	$ 44,400
(a) Station work		9,280
(b) Increase and repairs of buildings for the line		30,750
(c) Engineering work		4,370
4. Extraordinary expenses	Total	$ 40,000
(a) Repairs of Locos		40,000

The above-quoted annual extraordinary capital expenditure totals $810,210.

The total amount of the estimated capital expenditure is $1,293,210.

Explanation.—The annual receipts, in comparison with the estimate for 1912, shows an increase of a little over $300,000, but in comparison with the actual receipts for 1912 is a decrease of some teh thousands of dollars. The present increase is due to the fact that we have over-estimated the transportation of coal and under-estimated freight from cereals. The increase of six locomotives and one hundred coal wagons under the heading of capital expenditure is for the purpose of developing traffic. In viewing the progress of the traffic business, and the prosperity of the transportation affairs of this line the extension of construction work therefrom is inevitable. An increase of turntables and other important adjuncts are still under consideration and negotiation, so they have not been estimated in this budget.

TAOKOW-CHINGHUA RAILWAY.

Estimated Traffic Receipts.

1. Coaching Receipts	Total	$ 555,000
(a) Passengers		100,000
(b) Freight		455,000
2. Miscellaneous.	Total	8,100
(a) Rental		8,000
(b) Interest		Nil.
(c) Miscellaneous		100
The above-quoted Receipts total		563,100

Estimated Traffic Expenditure.

1. General expenses.	Total	75,120
(a) Salaries or wages		56,360
(b) Running expenses		7,160
(c) Miscellaneous		11,600
2. Traffic expenses	Total	45,500
(a) Salaries or wages		29,000
(b) Running expenses		10,500
(c) Miscellaneous		6,000
3. Workshop expenses	Total	124,000
(a) Salaries or wages		24,600
(b) Running expenses		43,200
(c) Reserve expenses		56,200
(d) Miscellaneous		Nil.
4. Maintenance expenses	Total	149,500
(a) Salaries or wages		9,000
(b) Running expenses		1,000
(c) Reserve expenses		138,500
(d) Miscellaneous		1,000
5. Interest on Loans	Total	408,110
(a) Foh Company (福公司)		401,000
(b) Ministry of Communications		7,110
6. Contribution for the Ministry of Communications		9,600

The above-quoted expenses total $811,830

The difference between receipts and expenditure under the heading of Traffic shows a deficit of $248,730

Estimated Extraordinary Capital Expenditure.

1. Increase of Rolling stock	Total	$ 168,000
(a) Locomotives		Nil.
(b) Passenger Cars.		Nil.
(e) Goods wagons		168,000
2. Extension of construction work	Total	$ 18,000
(a) Station work		18,000

The above-quoted extraordinary expenditure totals $186,000

Explanation.—The estimate of traffic receipts of $516,500 made for July 1912 to June 1913, is exceeded by $39,000 in the estimate for 1913-14, that being due to an increase in the receipts from passengers.

3. The estimate of expenditure made for July 1912 to June 1913 amounted to about $880,000. We make it less by $70,000 for this term.

SHANGHAI-NANKING RAILWAY.

This line is in close competition with navigation by numerous waterways. We have tried to devise means to divert traffic from those routes, but financial stringency has prevented an adequate development of transportation facilities in the shape of an increase of rolling stock, etc. The various items under the heading of Capital were included in last estimate, but so far they have not been carried out. The most important items are the increase of rolling stock and the construction of sub-lines at Nanking station. Work at Chinkiang station is also important. The expenditure now estimated exceeds that of the previous year by $80,000, which amount is for the erection of a goods depôt at Nanking station.

Estimated Traffic Receipts.

1. Coaching	Total	$ 2,975,000
(a) Passengers		2,300,000
(b) Freight		675,000
2. Miscellaneous		50,000
	Grand Total	$ 3,025,000

ESTIMATED TRAFFIC EXPENDITURE.

1. General expenses	Total	$ 424,500
(a) Salaries or wages		238,000
(b) Running expenses		24,500
(c) Miscellaneous		162,000
2. Traffic expenses.	Total	$ 464,500
(a) Salaries or wages		260,000
(b) Running expenses		82,500
(c) Miscellaneous		122,000
3. Workshop expenses	Total	$ 654,000
(a) Salaries or wages		66,000
(b) Running expenses		379,500
(c) Reserve expenses		196,500
(d) Miscellaneous		12,000
4. Maintenance Expenses	Total	$ 282,000
(a) Salaries or wages		72,300
(b) Running expenses		4,100
(c) Reserve expenses		200,200
(d) Miscellaneous		5,400
5. Interest on Loans	Total	$ 1,595,000
6. Contribution for the Ministry of Communications		66,000

The above-quoted estimated traffic expenditure totals $3,486,000

The difference between receipts and expenditure shows a deficit of $461,000

ESTIMATED EXTRAORDINARY CAPITAL RECEIPTS.

1. Contribution of Land-purchasing shares. Total $ 1,390,000.

Remarks: Owing to financial stringency, the increase of rolling stock and the extension of construction work for the benefit of the line have either been set aside or postponed. It is now proposed to effect or to make a contribution of land-purchasing shares, the funds from which are to be used for the repayment of the money that the Government has paid for the purchase of land for the line.

The funds shall be assigned to this line for the increase of rolling stock and the extension of construction work. The funds total £150,000, which is equivalent to $1,390,000.

The above-mentioned proposal has not yet been approved, and we include it in the estimates only provisionally,

ESTIMATED EXTRAORDINARY CAPITAL EXPENDITURE.

1. Increase of rolling stock	Total	$ 978,800
(a) Locomotives		264,300
(b) Passenger Cars		161,000
(c) Goods wagons		553,500
2. Increase of Machinery supplies	Total	$ 17,600
(a) For Locomotives		10,600
(b) For Construction		7,000
3. Extension of Construction work	Total	$ 157,000
(a) Roadbed		25,000
(b) Stations and Workshop		132,000

The above-quoted extraordinary expenditure totals $1,153,400.

The difference between Capital receipts and expenditure shows a profit of $236,600.

CANTON-KOWLOON RAILWAY (KUANG-CHIU)

ESTIMATED TRAFFIC RECEIPTS

1. Coaching Receipts	Total	$ 720,000
(a) Passengers		650,000
(b) Freight		70,000
2. Miscellaneous	Total	$ 4,000
(a) Rental on land		2,000
(b) Interest		Nil
(c) Miscellaneous		2,000

The above-quoted Receipts total $724,000

ESTIMATED TRAFFIC EXPENDITURE

1. General expenses	Total	$ 209,416
(a) Salaries or wages		154,446
(b) Running expenses		12,608
(c) Miscellaneous		42,362
2. Traffic expenses	Total	$ 101,746
(a) Salaries or wages		88,568
(b) Running expenses		9,848
(c) Miscellaneous		3,330
3. Workshop expenses	Total	$ 237,603
(a) Salaries or wages		50,478
(b) Running expenses		134,520
(c) Reserve expenses		45,180
(d) Miscellaneous		7,425
4. Maintenance expenses	Total	$ 132,516
(a) Salaries or wages		93,276
(b) Running expenses		3,040
(c) Reserve expenses		31,600
(d) Miscellaneous		4,600
5. Interest on Loans	Total	$ 914,250
(a) British and Chinese Corporation		902,250
(b) Bonus		12,000
6. Contribution for the Ministry of Communications		33,600

The above-quoted expenditure totals $1,629,131.

ESTIMATED EXTRAORDINARY TRAFFIC EXPENDITURE

1. Lawyer's fee	$ 2,500
2. Compensation fee	$ 1,000
Total	$ 3,500

The final total of traffic expenditure amounts to $1,632,631

The difference between traffic receipts and expenditure shows a deficit of $908,631

ESTIMATED EXTRAORDINARY CAPITAL RECEIPTS

1. Provisional Loan from the British and Chinese Corporation	$ 50,000

Remark.—An agreement has been ratified for the said loan of £50,000. It is agreed that out of the loan £35,000 is to be used for purchasing rolling stock, and the remaning £15,000 is to be used for repaying the cost of cars which were purchased from the Peking-Mukden Line. Those cars are taken as the security for the loan. The loan bears interest at 7% annually, and its duration is fixed at two years.

The repayment may be made at one time, or in four instalments.

ESTIMATED EXTRAORDINARY CAPITAL EXPENDITURE

1. Increase of Rolling stock	Total	$ 508,241
(a) Locomotives		125,000
(b) Passenger cars		72,000
(c) Goods wagons		138,000
(d) Cost of cars built by Peking-Mukden Railway		173,241
2. Increase of Machinery supplies	Total	$ 8,000
(a) For stations		8,000
3. Extension of Construction work	Total	$ 39,800
(a) Ta-sar-due station		25,000
(b) Other stations		14,800
4. Miscellaneous expenses for Extension business		6,000

The above-quoted extraordinary expenditure totals $562,041

The difference between capital receipts and expenditure shows a deficit of $62,041

Explanation.—1. The annual receipts estimated for this term show an increase of about $80,000 in comparison with the estimate for the past term (July 1912 to June 1913). The coaching receipts have shown no progress, owing to several reasons: (1) deficiency of rolling stock and imperfect construction work, (2) unjust taxation by the taxation bureau, (3) lack of uniform currency.

The extraordinary capital expenditure estimated for the previous term (January to June 1913) was not utilised, so it is included in this term.

KIRIN-CHANGCHUN RAILWAY

ESTIMATED TRAFFIC RECEIPTS

1. Coaching receipts	Total	$ 500,099
(a) Passengers		265,289
(b) Freight		234,810
2. Miscellaneous receipts	Total	$ 6,240
(a) Rental		5,240
(b) Interest		Nil
(c) Miscellaneous		1,000

The above-quoted receipts total $506,339

ESTIMATED TRAFFIC EXPENDITURE

1. General expenses	Total	$ 158,040
(a) Salaries or wages		95,440
(b) Running expenses		38,000
(c) Miscellaneous		24,600
2. Traffic expenses	Total	$ 140,943
(a) Salaries or wages		99,930
(b) Running expenses		14,373
(c) Miscellaneous		26,640

3. Workshop expenses	Total	$ 257,800
(a) Salaries or wages		76,000
(b) Running expenses		141,800
(c) Reserve expenses		37,000
(d) Miscellaneous		3,000
4. Maintenance Expenses	Total	$ 428,000
(a) Salaries or wages		200,000
(b) Running expenses		10,000
(c) Reserve expenses		213,000
(d) Miscellaneous		5,000
5. Interest on Loan		118,250

The above-quoted expenditure totals 1,103,033

The difference between traffic receipts and expenditure shows a deficit of $596,694

ESTIMATED EXTRAORDINARY CAPITAL EXPENDITURE

1. Increase of Rolling stock	Total	$ 465,400
(a) Locomotives		216,880
(b) Passengers cars		77,120
(c) Goods wagons		171,400
2. Increase of Machinery supplies	Total	$ 32,000
(a) For workshop use		32,000
3. Extension of construction work	Total	$ 693,300

The above-quoted extraordinary expenditure totals $1,190,700

Explanation.—Since the opening of traffic on this line things have not been properly and completely arranged, and it is impossible to make out an exact estimate of the traffic receipts. We make it amount to $500,000.

CHUCHOW-PINGHSIANG RAILWAY.

ESTIMATED TRAFFIC RECEIPTS.

1. Coaching Receipts	Total	$ 575,780
(a) Passengers		77,100
(b) Freight		498,680
2. Miscellaneous	Total	$ 3,450
(a) Rental		3,038
(b) Interest		Nil.
(c) Miscellaneous		412

The above-quoted receipts total $579,230

ESTIMATED.

1. General expenses	Total	$ 62,351
(a) Salaries or wages		48,459
(b) Running expepses		5,832
(c) Miscellaneous		8,060
2. Traffic expenses	Total	$ 63,148
(a) Salaries or wages		53,884
(b) Running expenses		7,464
(c) Miscellaneous		1,800
3. Workshop expenses.	Total	$ 136,810
(a) Salaries or wages		30,966
(b) Running expenses		49,464
(c) Reserve expenses		55,120
(d) Miscellaneous		1,260
4. Maintenance Expenses	Total	$ 139,044
(a) Salaries or wages		11,584
(b) Running expenses		860
(c) Reserve expenses		125,700
(d) Miscellaneous		900

The above-quoted expenditure totals $401,353

The difference between traffic receipts and expenditure shows a profit of $177,877

ESTIMATED EXTRAORDINARY CAPITAL RECEIPTS.

1. Sale of waste	$7,400

ESTIMATED EXTRAORDINARY CAPITAL EXPENDITURE.

1. Increase of Rolling stock	Total	$ 42,000
(a) Locomotives		Nil.
(b) Passenger cars		Nil.
(c) Goods wagons		42,000
2. Increase of Machinery supplies	Total	$ 23,000
(a) Workshop		23,000
3. Extension of Construction work	Total	$ 86,000
(a) Maintenance Department		86,000
4. Repayment of Loans	Total	$ 73,000
(a) The Commissioner of Finance, Hunan		45,000
(b) Peking-Mukden Railway, building of cars		28,000

The total extraordinary expenditure amounts to $224,000

The difference between Capital receipts and expenditure shows a deficit of $216,600.

Explanation.—The Coaching receipts for this term exceed by more than $200,000, those estimated for the first year (1912) of the Republic.

The extension of construction work such as the building of two steel bridges at Sian-Tung and Tun-sin has not been fixed in the estimate for this term because of the deficit between the receipts and the expenditure.

The increase of 20 large flat wagons has been left out of this estimate, and the increase of 20 large coal wagons has been halved in this estimate, that is only 10 wagons have been provided for.

PEKING-KALGAN LINE.

ESTIMATED TRAFFIC RECEIPTS.

1. Coaching	Total	$1,763,100
(a) Passengers		394,200
(b) Freight		1,368,900
2. Miscellaneous		95,021
(a) Rental on land and Cars		92,870
(b) Interest		Nil.
(c) Miscellaneous		2,151

The above-quoted receipts total $1,858,121.

ESTIMATED TRAFFIC EXPENDITURE.

1. General expenses	Total	$ 142,760
(a) Salaries or wages		103,120
(b) Running expenses		10,000
(c) Miscellaneous		29,640
2. Traffic Expenses	Total	$ 289,480
(a) Salaries or wages		134,560
(b) Running expenses		30,120
(c) Miscellaneous		124,800
3. Workshop expenses	Total	$ 396,000
(a) Salaries or wages		87,600
(b) Running expenses		198,000
(c) Reserve expenses		109 200
(d) Miscellaneous		1,200
4. Maintenance expenses	Total	$ 260,600
(a) Salaries or wages		24,000
(b) Running expenses		2,400
(c) Reserve expenses		231,800
(d) Miscellaneous		2,400

The above-estimated expenditure totals $1,088,840.

ESTIMATED EXTRAORDINARY TRAFFIC EXPENDITURE.

1. Preparation for	Total	$ 62,000
(a) Accidental construction work		50,000
(b) Extraordinary expenses		12,000

The above estimate totals $62,000. The final total of the traffic expenditure amounts to $1,150,840.

The difference between traffic receipts and expenditure shows a profit of $707,281.

ESTIMATED EXTRAORDINARY CAPITAL EXPENDITURE.

1. Increase of Rolling stock	Total	$ 540,000
(a) Locomotives		Nil.
(b) Passenger Cars		Nil.
(c) Goods wagons		540,000
2. Increase of Machinery supplies	Total	$ 13,500
(a) Workshop, Nankow		2,000
(b) " "		2,000
(c) See-Ju-Mon, Kong-Chwang, and Sha-Hwa-yuen		7,500
(d) Angle rails for Kong-Chwang and Jiu-Yong-Kwan		2,000
3. Extension of construction work	Total	$ 108,568
(a) Work for Joo-Muh and Sing Chwang Tse		12,000
(b) See-Ju-Mon to Chang-Cha-Kow work for stations		11,098
(c) Work for Chang-Cha-Kow station		270
(d) Work for Nankow		72,310
(e) Work for See-Ju-Mon		12,890

The estimated Capital expenditure totals $662,068.

Explanation.—The estimated receipts for last year averaged $150,000 monthly, but the actual receipts slightly exceeded the estimate.

The estimate of the traffic and the extraordinary traffic expenditure for the previous term was fixed at an average of $100,000 monthly. The estimate for this term is made on the basis of the actual expenditure for the first year (1912) of the Republic.

KALGAN-SUIYUAN RAILWAY.

Estimated Traffic Receipts

1. Traffic receipts	Total	$ 378,000
(a) Passengers		86,400
(b) Freight		291,600
2. Miscellaneous Receipts	Total	10,411
(a) Rental		8,500
(b) Interest		Nil.
(c) Miscellaneous		1,911
The above estimated receipts total		388,411

Estimated Traffic Expenditure

1. General expenses		49,580
(a) Salaries or wages		37,380
(b) Running expenses		3,660
(c) Miscellaneous		8,540
2. Traffic expenses	Total	84,600
(a) Salaries or wagis		38,400
(b) Running expenses		6,000
(c) Miscellaneous		40,200
3. Workshop expenses.	Total	$ 94,800
(a) Salaries or wages		22,800
(b) Running expenses		42,000
(c) Reserve expenses		30,000
(d) Miscellaneous		Nil.
4. Maintenance expenses.	Total	$ 120,777
(a) Salaries or wages		46,500
(b) Running expenses		2,730
(c) Reserve expenses		69,237
(d) Miscellaneous		2,310
The above estimate of expenditure totals		$ 349,757

Estimated Extraordinary Traffic Expenditure

1. Funds for accidental construction or repairing work	$ 50,000

The final total of the above estimated traffic expenditure amounts to $399,757. The difference between traffic receipts and expenditure shows a deficit of $11,346.

Estimated Extraordinary Capital Expenditure

1. Increase of Rolling Stock	Total	$ 550,000
(a) Locomotives		280,000
(b) Passenger Caes		Nil.
(c) Goods wagons		270,000
2. Extension of construction work	Total	$ 9,864
(a) Work for Kalgan to Yung-cha-Pao		1,852
(b) Work for Yung-cha-Pao to Yang-Kao		8,012
3. New construction work	Total	$ 2,142,857
(a) Work from Yang-Kao to Tar-Tung		2,142,857

The above estimated extraordinary expenditure totals $2,702,721.

Explanation.—The estimate of permanent receipts for the previous term was made at an average of $30,000 monthly, but the actual receipts were slightly in excess of the estimate.

Extra-Increase on the Budget Already Made

PEKING-HANKOW RAILWAY

Estimated Traffic Receipts

Freight receipts $49,547.83.

Remarks.—The Taxation Station at Fong-Tai has been abolished. The Peking-Kalgan, Peking-Mukden and this line have agreed to pay annually the tax usually collected by the station. The abolition of the station will mean an increase on Merchandise receipts.

Traffic Expenditure

General expenses $49,547.83.

Remarks.—The total amount that the three mentioned railways have been ordered to pay for the Taxation Station is Tls. 100,000. This line agrees to pay Tls. 33,000, which is equivalent to $49,547.83.

The Peking-Kalgan Railway agrees to pay Tls. 34,000, or $51,049.27.

The Peking-Mukden Railway agrees to pay Tls. 33,000, or $49,547.83.

KIRIN-CHANGCHUN RAILWAY

Extraordinary Traffic Expenditure

1. Engineering work for the repair of the line injured by the flood during May, June, and the first part of July. Total $128,920.

TIENTSIN-PUKOW RAILWAY

Traffic Expenditure

1. General expenses.	Total	$ 38,382
(a) Salaries or wages		32,160
(b) Running expenses		960
(c) Miscellaneous		5,262

Remarks.—The T.-P. R. is the most important line between the North and South. The districts through which it runs, are considered to be the homes of outlaws. At times when war breaks out in the country it serves as a line especially for military affairs. Already trained railway police and railway soldiers are not sufficient in number for the protection of the line. When a policeman, or a soldier vacates his duty it is impossible to fill up the vacancy with an untrained hand. Therefore we see the necessity of enlisting more men and establishing a school in which they are to be trained. We consider such action very important especially for the time being when things are not conducive to tranquillity.

This extra estimate is made wholly for this purpose amounting to $38,382.

CHEFOO BREAKWATER

The arrival of two engineers from Holland to plan a breakwater for Chefoo Harbor brings that work a step on the way. The Commission, which consists of representatives of the Consular Body, Commissioner of Customs, Chinese Superintendent of Customs and Chinese and foreign Chambers of Commerce, have arranged for the levying of a surtax on shipping for the purposes of the work, and this fund will be collected by the Customs and placed at the disposal of the Commission for administration. The engineers will prepare plans for the breakwater, and will submit them to Peking for the consideration of the Central Government and the Diplomatic Corps. The Commission is in a sense similar to the Huangpoo Conservancy and the Hai-ho Conservancy.

It is interesting to note that an effort is being made to induce the Chinese to take steps to make the Newchwang harbor satisfactory. Great attention is needed to even keep the little trade that remains. Otherwise it will drift to Dalny as the trade of Chefoo has drifted to Tsingtao.

WIRELESS BETWEEN JAPAN AND HAWAII

A Tokyo paper reports that the Japanese Department of Communications with a view to establishing a wireless service between Japan and Hawaii, made a trial in December 1909 between the Choshi Wireless Station and that at Cafk (?) in the Hawaiian islands, a distance of 3,300 nautical miles. The power used was only 20 kilowatts, yet the message was most distinctly received by the *Korea*, which happened to be 3,150 nautical miles from Choshi.

The result greatly encouraged the Japanese authorities, who subsequently decided to erect a big wireless station at Choshi. The Cabinet has now consented to an outlay of 400,000 yen for the undertaking in the next fiscal year.

MR. CHANG WU

Mr. Chang Wu, whose portrait we give in this issue, is a native of Chekiang. Before taking his present post in association with Sir Richard Dane, he had become recognised as one of the foremost authorities on matters connected with the Salt Gabelle. During the Manchu *régime* he was engaged in the management of financial and salt affairs in the province of Fukien. The Republican Government appointed him to take charge of all matters pertaining to salt in the Three Eastern Provinces. He introduced many reforms, notably the system of direct taxation in the salt-producing districts of the province of Fengtien. The improvements in management which he made proved very efficacious and the revenue from salt taxation showed a remarkable increase.

Mr. Chang took up the post of Chang Lu Salt Commissioner in the first year of the Republic and that of Liang Hwai Salt Commissioner in the second year.

GOLD DREDGING IN ALASKA

A Washington telegram reports:—Thirty-eight gold dredges were operated in Alaska in 1912, compared with twenty-seven in 1911, according to a report of the United States Geological Survey. These dredges handled about 3,600,000 cubic yards of material, recovering gold worth $2,200,000. Since 1880 the placers of Alaska have yielded gold valued at $154,800,875. The mines have also produced $960,743 worth of silver. The placers produced in 1912 gold worth $11,990,000. (It is to be noted that the above production averages over 61 cents gold per yard. Much of the ground handled had a much higher value. Dredging costs in Alaska vary from 20 to 50 cents gold per yard according to local conditions and methods of working.)

OPENING OF THE PANAMA CANAL

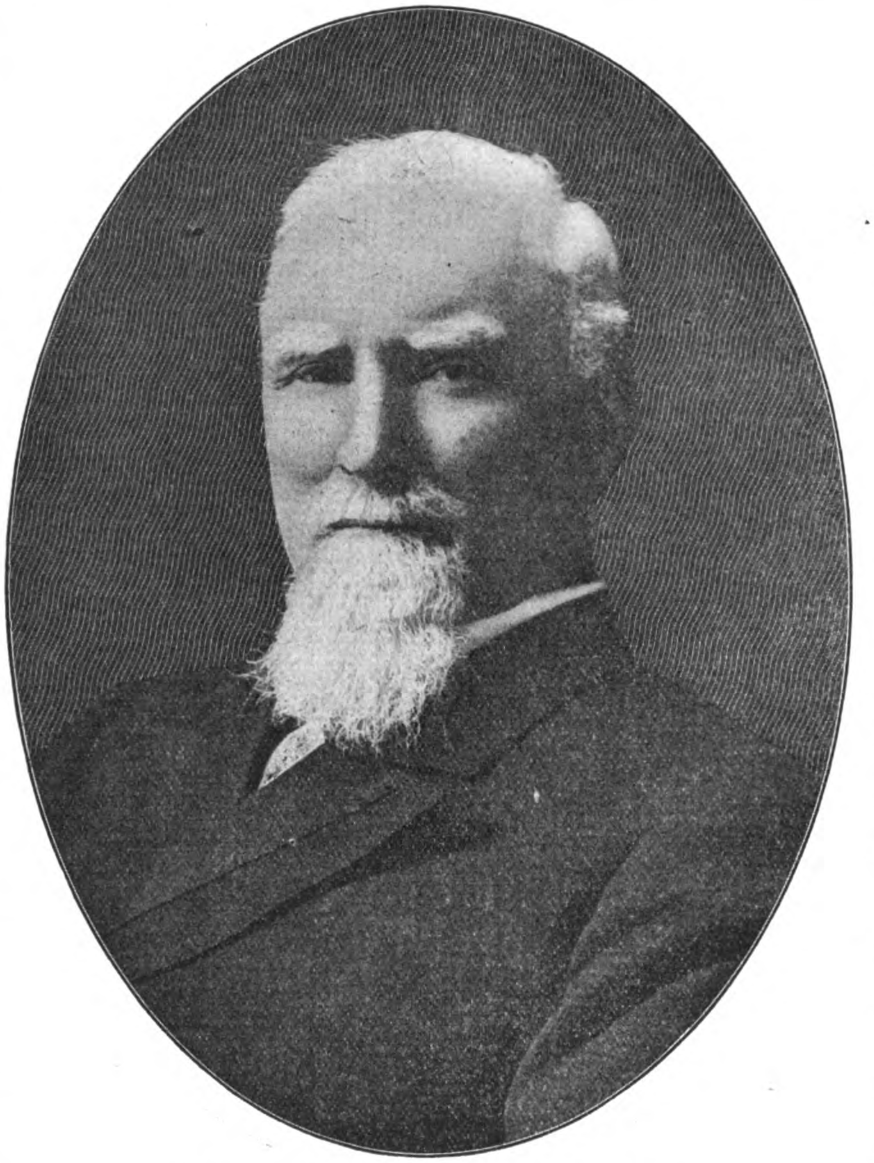
VIEWS OF A SHIPPING EXPERT

One of the most important questions that will affect the use of thet Panama Canal by West Coast lumbermen is involved in the shipping problem. The shipping laws of the United States prohibit any other than American built and owned vessels from engaging in the coastwise trade, and trade between the two coasts of the United States is declared to be of coastwise character. But American shipping, because of the peculiar laws of the country, costs more to build and to operate than vessels carrying the flags of other important commercial nations. The bearing that these facts will have upon the volume of lumber business via Panama is giving Pacific coast lumbermen much concern as they face the opening of the Canal and begin to consider how they shall take best advantage of that route. They have to consider competition they will meet from British Columbia mills, whose products can be shipped to the Atlantic coast under any flag, as well as actual costs.

Perhaps the best authority on this matter is Robert Dollar, of San Francisco, a lumberman and a shipper. For twenty-five years he has been engaged in business on the Pacific coast, during which time he has acquired a considerable fleet, most of it engaged by the foreign trade, and therefore of a character that can use the Canal route. A studied opinion from him is of value, and the *American Lumberman* asked Mr. Dollar to give its readers an analysis of the shipping phase of the problem, which he has cordially complied with, as follows:

"We need only consider the movement as being from west to east. No doubt some yellow pine and hardwood will move from east to west, but the volume will be comparatively small. A great deal of uncertainty exists on this question. As it is one largely of shipping I will endeavor to show the situation from that viewpoint.

"Commodities can be carried profitably in small steamers a short distance only. The greater the distance the larger the vessel required. For example, a vessel carrying 500,000 feet of lumber could not profitably be run a greater distance than 750 miles. I have experimented with different sized vessels between Puget Sound and China, the distance being about the same as to New York via the Canal, and found that three millions would be a minimum, and any cargo up to five millions is much more profitable.



Mr. Robert Dollar, of San Francisco, head of the Robert Dollar Company.

"Among the Ameriean vessels engaged in the lumber trade on this Pacific coast there is not one large enough. The new steamer *John A. Hooper* is the largest, and it carries only 2,250,000 feet, and among the ordinary cargo boats, outside of the regular lines, I do not know of a single available vessel, so that lumber carrying will have to be done by the regular liners. The American-Hawaiian, Grace & Co., and Luckenback Steamship Company all have vessels that will carry lumber, although they are all better adapted for general merchandise than for lumber, and in regular liners sailing promptly on time lumber cargoes are not as desirable on account of slower loading and discharging; but to develop the lumber trade to the best advantage steamers especially built for the lumber trade would be the most successful and would develop the trade better. At the present time there is no talk of any such vessels being built. That is the vessel situation from and between American ports.

"We now have to consider the situation from a British Columbia point of view; that is, carrying lumber from there to New York. Any foreign steamer may engage in this trade, so it is free to the competition of the world, any number of suitable steamers being at all times available.

"The price of lumber in British Columbia has been higher than on the American side, but at present the price is about the same on each side of the line, so it comes down to the cost of transportation. The following is a comparison of two ships of the same size:

Dead Weight.	*British from British Columbia*	*American from Puget Sound.*
First cost of an 8,000-ton D. W. steamer that would carry 4,000,000 (I doubt if the American vessel could be bought for this price today)	$250,000	$500,000
Cost of carrying a cargo of lumber from British Columbia or Puget Sound to New York, the total time loading, discharging and steaming, estimated duration 60 days; distance 6,000 miles; interest on investment, 6%; insurance, 6%, and depreciation, 5%, a total of 15%	7,083	14,166
White crew wages and stores of all kinds......	8,640	10,040
1,050 tons coal at $5..	5,250	5,250
Canal tolls (American measurement)	4,800	......
Tonnage dues, pilotage, etc.	600	520
Stevedoring 4,000,000 feet in and out........	6,200	7,200
10% profit on investment for 60 days	4,166	8,333
Total cost of carrying 4,000,000 feet ......$	36,739	$ 45,509
Average cost per M feet	$9.18	$11.38

"Our Government has not told us on what measurement tolls will be paid. I have put in American measurement. I assume Congress will take off the duty; if not, that must be added to the British cost.

"If oil were used for fuel that would reduce the cost 50 cents a thousand, but in the above calculation no provision has been made to take the vessel back to the Pacific coast. I assume, however, it could get enough to pay its own way, and if an Asiatic crew were employed on the British ship the price would be further reduced.

"You will see that the first cost of an American steamer is the first serious handicap, and with the higher cost of American wages it runs up the cost so that competition is impossible. Needless to say, British Columbia will supply all the lumber it can cut for our eastern market

"An agitation is going on to make the Americans pay the Canal dues, but you will agree that the American ship is loaded with expense to the sinking point. Is it any wonder that no ship came under our flag after the rider on the Panama Canal Bill permitted foreign ships to be registered as American bottoms? The reason for this is explained fully in the article

I wrote recently on the "American Merchant Marine;" and is it any wonder that one time we had the largest number and the best ships afloat and now we are down to less than 500,000 tons in the foreign trade?

"We on the seaboard ask you people of the Middle West to wake up your Congressmen and compel them to give us merchant marine to engage in the foreign trade to carry your products, and without costing our country one cent

Robert Dollar is of Scotch descent and Scotch birth. He was born in Falkirk sixty-nine years ago. His birth and his career almost from his infancy foreshadowed his future. By inheritance as well as inclination and training he is, as has aptly been said of him, "a lumberman from the ground up." His father was manager of the lumber firm Robert Melville & Co., in the son's native town, and the latter's birth occurred in apartments above the office of that concern. Robert's theoretical schooling ended in his twelfth year, when he entered upon a year's work as office boy in a shipping office. A year later he migrated with his parents to Ottawa, Ontario, and in the following year he began his first experience in lumbering, as assistant to the cook in one of Hamilton Bros.' camps on the Gatineau River, 200 miles from civilization—a rare and enlightening experience for a "green" Scotch boy. At the age of 21 Robert Dollar had become foreman of a lumber camp operated by Hamilton Bros.

Six years later Mr. Dollar began business on his own account. He bought a small tract of timber in the Muskoka district and started lumbering, but his new venture met with disaster, for the historical panic of "Black Friday" swept it and that of thousands of others out of commercial existence. Undaunted, he sought and secured employment and became manager of the big lumber interests of H. H. Cook. With characteristic Scotch thrift and courage he handled the new position so well that at the end of four years he had discharged his debts in full. He then resumed business as a principal, this time as a partner of Mr. Cook, and engaged in getting out hewn timber for the English market. Finding larger timber obtainable in Michigan, he moved over to the American side in 1880, starting first at Grand Marias. Later he built the Dollarville mill, at the thriving town named in his honor, but sold this plant later to Danaher & Melendy, who operated it successfully for many years.

In 1888 Mr. Dollar transferred his interests and his activities to the Pacific coast and engaged in lumbering redwood in Sonoma and Mendocino counties. To move this product he bought or built steamers, starting modestly, but later acquiring a fleet now grown beyond all his earlier expectation. At present he has ownership-control of eight British steamers of a capacity of over 30,000,000 feet engaged in transporting lumber to China, Japan and the Philippines, besides several steamers in the coastwise business, trading as far north as Alaska and south to Panama.

Mr. Dollar's experiences have included perforce a wide knowledge of men and of measures of national import; without theoretical training in that direction, he is a practical diplomat. When the San Francisco school question became acute his was the able influence that gathered a party of influential citizens from Coast chambers of commerce and sent them on a diplomatic mission to Japan. They were well received by the higher officials of that country, including its emperor, and a result was the abrupt cessation of war talk. Noting the benefits of such diplomacy, two years later Mr. Dollar formed a similar party to go to China. There they had what is said to have been the greatest reception ever recorded purely commercial representatives in any foreign country, the Chinese emperor and all the country's highest officials extending to the visitors the highest honors. The outcome included the forming of permanent friendship and establishing of good will between the two nations.

Mr. Dollar is a persistently hard worker. Besides constant personal attention to his direct interests he has served as president of the Merchants' Exchange and the Chamber of Commerce of San Francisco. More than half of his time is said to be given to philanthropic work. In recognition of this, on his recent visit to his native home in Scotland its authorities conferred upon Mr. Dollar the unusual honor of "freedom of the burgh."

MURORAN STEEL WORKS

To place the works on a more workable basis the authorities of the Japan steel works and the representative of the British shareholders have been holding repeated conferences. Recently the directors of the Hokkaido Tanko Kisen Kaisha, one of the leading shareholders of the works, met in conference on the premises of the Mitsui firm to receive a report on the result of the repeated conferences with the foreign shareholders, from Dr. Dan who represented the company at the conferences. After careful deliberation it was decided that the interests of the company would henceforth be represented by the Mitsui Firm.

Later the representatives of the British shareholders visited Dr. Dan at the Mitsui Firm and held a conference behind closed doors about the reorganization of the works and the appointment of the successor of Admiral Baron Yamanouchi, the President, who has resigned his post on account of a divergence of opinion with the foreign capitalists in regard to the management of the works. As a result of the conference a definite agreement is said to have been arrived at between the Japanese and foreign capitalists whereby reforms shall be carried out in the working of the foundry, and the court of directors shall be reorganized, though the particulars of the agreement are still kept secret.

The board of directors of the Japan steel works sat in council the following day to receive letters of resignation from the retiring officials. After formal discussion the resignations were formally accepted. An extraordinary meeting of shareholders will, it was also decided, be convened for the election of officials when an agreement has been arranged among the larger shareholders as to the selection of the candidates.

According to the *Tokyo Asahi* the board of directors will be completely reorganized, new men to be elected for the vacant posts. Contrary to general expectation Dr. Dan will not be nominated for the presidency. Mr. Noble and Mr. Vickers, representatives of the British shareholders, at the last conference, expressed their desire to recommend one of the foreign officials for the post. An objection has been raised, however, to the proposal by the Japanese shareholders. If Mr. Noble and Mr. Vickers insist on this point there is every reason to believe Japanese candidates will decline to stand for the posts. It is anticipated Count Hirosawa, Admiral Midzutani, and Mr. Imahara will be recommended for directorship.

WIRELESS STATION AT CANTON

The Canton authorities are reported to contemplate the erection of a new wireless station in the city. There has been a small station, in connection with the local Admiralty, for some time, but apparently this is too feeble to meet present conditions. The new site is said to comprise an area of 1,000 square yards, and this space is needed for the apparatus and rooms for the accommodation of the employees. The site chosen is near the Assembly Hall, and this is regarded as a point in its favour. Moreover, it is near the parade ground, and all round the site are the military and naval establishments of the city, so that it will be very convenient for sending and receiving messages, and also will be easy of protection in case there is further trouble or civil war. The report does not state what it will cost, or who will be responsible for the construction of the plant.

The Pacific Commercial Company, Manila, P.I., report considerable activity in the agricultural machinery field for the month of November. Sixteen steam tractors and trashers of the Gaar Scott line of the Rumbley Products Co., arrived and were delivered to the buyers. Each of the trashing sets have a capacity of from 800 to 1,000 cavans (cavan—125 lbs.) of hay per day.

An official return gives the successful artesian bores of Queensland at 866 in number, and the following gives their water supplies:—

Under 10,000 gallons per day	63
10,001 to 150,000 gallons per day	186
150,001 to 750,000 gallons per day	361
750,001 to 1,500,000 gallons per day	171
1,500,001 to 2,500,000 gallons per day	60
2,500,001 gallons per day and over	25
Total flowing bores	866

The Australian and New Zealand gold output for the first ten months of 1913 is reported as approximately 2,117,668 fine ounces, of a value of about £9,000,000; these figures showing a decrease of about 70,218 fine ounces, or a difference of about £298,500 in value, as compared with the corresponding period last year. A comparison of the figures for the ten months is as follow:—

	1911. Oz.	1912. Oz.	1913. Oz.
Victoria	432,152	395,269	364,718
New South Wales	152,639	137,366	123,346
Queensland	314,721	290,681	220,053
West Australia	1,136,098	1,059,501	1,084,011
*South Australia	9,500	6,500	7,000
*Tasmania	27,000	22,000	30,000
Commonwealth	2,072,110	1,911,317	1,829,128
New Zealand	363,501	276,569	288,540
Total	2,435,611	2,187,886	2,117,668

*Approximate.

MONO-TRAMWAY FOR TOKYO

Recently a committee meeting of the Tokyo Municipal Assembly was held when among other things, a proposal for the construction of an elevated mono-tramway was taken up for consideration. Some months ago Mr. Okuyama, an electric expert who spent long years abroad to specialize, and some eight others, applied to the Tokyo City Office for permission to build a suspended mono-tramway connecting Ueno Park with Asakusa Park, a distance of 1 mile 7 chains. The project was subsequently submitted to the Municipal Assembly for deliberation, which appointed a committee for further investigations. In the committee meeting Baron Sakatami, the Mayor, called attention to the paramount importance attaching, as he considered, to the permission or non-permission of the project. After prolonged discussion, it has been decided not to permit the project from the standpoint of unifying in future the Tokyo city tramway system.

RAILWAYS IN CHOSEN (KOREA)

RECORD OF A YEAR'S PROGRESS

From the excellent annual report on reforms and progress in Chosen (Korea) for 1911-12 we take the following information relating to railways:—

The total length of the railway lines open to traffic, passenger or freight, was 767.6 miles at the end of the fiscal year 1910, showing an increase of 93 miles, as compared with the preceding fiscal year. This increase was principally due to the opening of portions of the Keifo-Gensan and Taiden-Kunsan lines, a branch line running from Pyong-yang to the Government Coal Mine, and the railway bridge over the Oryoku (Yalu) River. On examining operating results, the total train mileage is found to have been 2,307,667 miles, and the total traffic receipts, 5,629,856 yen, showing an increase, respectively, of 205,545 miles, and of 611,525 yen. Transportation traffic conducted during the fiscal year 1911, as compared with the preceding fiscal year, can be seen in the appended table:—

Description	1911-12	1910-11	Increase
	Miles	Miles	Miles
Length of lines open to Traffic	767.6	674.6	93.0
Total Train Mileage	2,307,667.0	2,102,122.0	205,545.0
Total Number of Passengers	2,429,687	2,024,490	405,197
	Kin	Kin	Kin
Total amount of Luggage	10,326,418	9,057,591	1,268,827
	Tons	Tons	Tons
Total Amount of Freight	1,063,111	888,723	174,388
	Yen	Yen	Yen
Total Receipts from Passengers	3,008,391	2,613,452	394,939
Total Receipts From Freight	2,621,465	2,404,879	216,586
Total Receipts	5,629,856	5,018,331	611,525
	Yen	Yen	Yen
Average Receipts from Passengers... ... ... per day	10.48	9.88	0.60
Average Receipts from Freight ... ... per day	9.53	9.23	0.30
Total Average Receipts ... ... per mile	19.90	19.06	0.84

In spite of the fact that traffic was often interrupted by floods in the summer time, passengers and freight, and receipts from both, as shown in the above table, increased owing to the general economic growth in the Peninsula.

As to the improvement of traffic, with the completion of the improvement work on the Keijo-Shingishu (Seoul-Shinwiju) line, the train service on this line, hitherto taking 14 hours, 15 minutes, was shortened to 12 hours, 20 minutes in April, 1911. When the railway bridge across the Oryoku (Yalu) River was completed on November 1, 1911, the trunk line running between Fusan and Shin-Gishu was connected with the Antung-Mukden line of Manchuria, and a tri-weekly express service, equipped with sleeping, dining and first class cars known as "the Chosen-Manchuria Express," was inaugurated. This service connects with the trans-Siberia Express by way of the Changchun-Harbin section of the Chinese Eastern Railway, and with the express train of the Imperial Railway in Japan proper by the Fusan-Shimonoseki ferry steamers. This express service taking only first class passengers makes an extra charge, called express extra ticket, in addition to the ordinary fare. The night train running on the Keijo-Fusan line every other evening was made a nightly service after December, 1911. In order to advance the convenience of passengers and shippers, the so-called joint services with the Imperial railways in Japan proper and the Manchuria railways were maintained by the railways of the Peninsula, and these services are increasing year by year. A similar service was also opened with the Nippon Yusen Kaisha and Osaka Shosen Kaisha which have steamship lines plying between Japan proper, Chosen and China.

The general account of the railway traffic for the fiscal year 1911, compared with that of the preceding fiscal year, shows much better results, as may be seen from the following table:—

Items	1911-12	1910-11	Increase Amount	Increase Percentage
	Yen	Yen	Yen	
Receipts from Traffic...	5,629,856	5,018,331	611,525	12.2
Receipts from Miscellaneous Sources	128,262	124,115	4,147	03.3
Total Receipts	5,758,118	5,142,446	615,672	12.0
Expenses	5,124,168	4,804,066	320,102	06.7
Profits	633,950	338,380	295,570	08.3

The total receipts from the railways for the fiscal year 1911 reached 5,758,118 yen, being an increase of 615,672 yen, or 12 per cent., as compared with the figures for the preceding fiscal year, while the total expense of operating the railways, including the expenses of the Railway Bureau, amounted to 5,124,168 yen, being an increase of 320,102 yen or 6.7 per cent. Thus the net profits of the railways amounted to 633,950 yen for the fiscal year 1911 against 338,380 yen for the preceding fiscal year (1910.) Under such circumstances the railways in the Peninsula are now gaining financial stability. As to the capital account of the railways, the increase for 1911 was about 9,240,889 yen. Adding this amount to the capital transferred from preceding years, the total capital reached 105,076,962 yen, of which 700,000 yen belongs to the account of the purchase of materials.

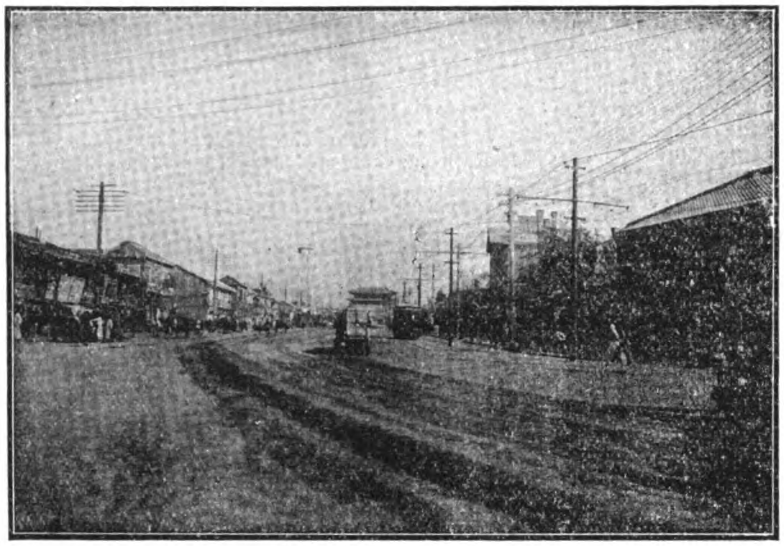
Railway Construction

The general plan of the construction of two railways—the Keijo-Gensan line, measuring 138 miles, and the Taiden-Mokpo line with a branch to Kunsan, measuring 175.8 miles—and the estimates of their cost were stated in the previous Annual Report. In the construction of the Keijo-Gensan line, the survey of which was commenced in April, 1910, 19.8 miles running between Ryuzan (suburb of Keijo) and Giseifu were completed up to August, 1911, and traffic along this distance was commenced at the same time. The civil engineering work on the section between Giseifu and Heiko, measuring 55.2 miles, was partly completed during the fiscal year 1911. On the other hand, in the construction commenced from the Gensan side, the distance between Gensan and Kosan measuring 288 miles, was surveyed during the same year, and construction of the first 13.6 miles starting from Gensan was begun. The construction of this line is expected to be completed by November, 1914. In the construction of the Taiden-Mokpo line of 161 miles with 14.8 miles branching out to Kunsan, the survey was commenced in May, 1910, and the civil engineering work in October. Up to the end of the fiscal year, 69 miles—38 miles of the Taiden-Kokei section, 17 miles of the Kokei-Riri section and 14.8 miles of the Kunsan branch—were constructed and opened to traffic. The construction of the line is not expected to be completed until April, 1914.

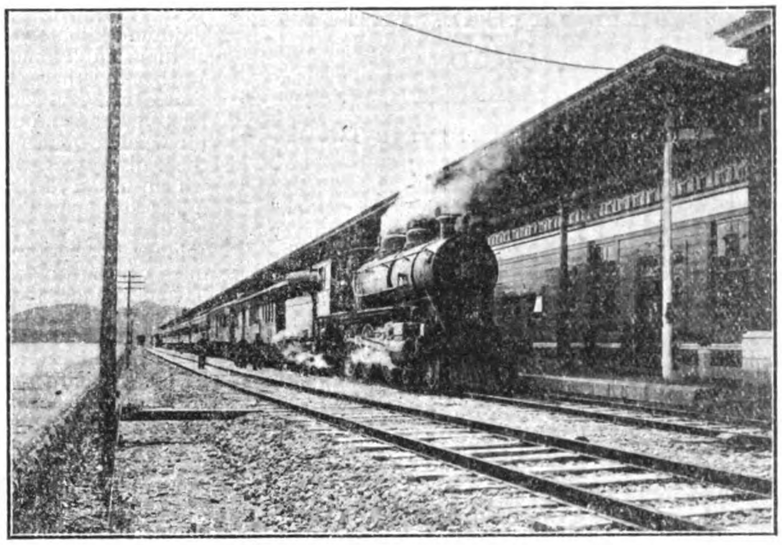
The building of a steel bridge over the Oryoku (Yalu) River connecting the Antung-Mukden line of Manchuria was commenced in August, 1909, and completed as estimated in October, 1911, in spite of the fact that the work was often interrupted by floods. The total length of this bridge is 3,098 feet, consisting of 12 spans of about 200 or 300 feet each. A span of 310 feet in the middle of the bridge is capable of being opened to permit the passage of ships. For the construction of this bridge an estimate of 2,000,000 yen was made, but the actual cost did not exceed 1,750,000 yen.

As to improvement of railway tracks, work on the Keijo-Shingishu line was completed in October, 1911, simultaneously with the completion of the building of the bridge over the Oryoku River. The improvement work on the Heijo-Chinnampo line, such as adjustment of sharp curves and grades, or replacing temporary bridges with permanent ones, etc., was more than half completed by the end of the fiscal year, 1911. Another improvement on the Fusan-Keijo line, viz., making a short cut between Iin and Yokusen and replacing a steel bridge on the Kan (Han) River, was commenced in the fiscal year 1911, and more than half was completed during the same fiscal year, while the remainder was expected to be completed in the fiscal year following.

For the account of railway construction and improvement works, 8,500,000 yen was apportioned for the fiscal year 1911. The surplus of the account for the previous fiscal year amounting to 189,086 yen being added to that amount, the total provided for the fiscal year 1911 was 8,689,086 yen, of which 8,625,257 yen was actually expended during the same fiscal year, leaving a balance of 63,829 yen. The following table shows the accounts for railway construction and improvement, apportioned according to fiscal years:—



A Street in Keijyo (Seoul)



Express Train leaving the Fusan Pier

Expenses defrayed during 1906-7—1911-12

Description	Estimate Yen	Net Expenses Yen	Balance Yen
Construction Expenses:—			
General Expenses	793,275	711,396	81,879
Keijo-Fusan Line	2,398,687	2,279,754	118,933
Keijo-Shingishu Line	20,723,614	22,028,574	— 1,304,960
Masan Line	357,275	659,146	— 301,871
Heijo-Chinnampo Line	1,886,040	1,003,961	882,079
Taiden-Mokpo Line	1,892,500	2,547,333	— 654,833
Kaijo-Gensan Line	2,607,000	3,195,952	— 588,952
Engines, Passenger and Freight Cars...	4,746,397	2,927,298	1,819,099
Railway Hotel	......	......	......
Total	35,404,788	35,353,414	51,374
Improvement Expenses...	605,230	592,630	12,600
Grand Total	36,010,018	35,946,044	63,974

Estimates apportioned after 1912-13

Description	1911-12 Yen	1912-13 Yen	1913-14 Yen	1914-15 Yen	Total Yen
Construction Expenses:—					
General Expenses	138,423	141,995	141,996	138,424	560,838
Keijo-Fusan Line	322,415	......	......	......	332,415
Keijo-Shingishu Line	2,025,486	......	......	......	2,025,486
Masan Line...	......	......	......	......	......
Heijo-Chinnampo Line	......	......	......	......	......
Taiden-Mokpo Line...	1,733,336	2,892,053	3,241,963	2,922,462	10,789,814
Keijo-Gensan Line	2,985,891	4,073,095	3,114,371	1,283,414	11,456,771
Engines, Passenger and Freight Cars	720,800	890,000	1,022,400	866,446	3,499,646
Railway Hotel	146,429	502,857	479,270	156,428	1,284,984
Total	8,082,780	8,500,000	8,000,000	5,367,174	29,949,954
Improvement Expenses	917,220	......	......	......	917,220
Grand Total	9,000,000	8,500,000	8,000,000	5,367,174	30,867,174

Tramways and Light Railways

As alluded to in the last Annual Report, tramways and light railways maintained by private corporations in the Peninsula were brought under the uniform control of the Railway Bureau of the Government-General after the Annexation. During the fiscal year 1911, six applications for construction of tramways and light railways were submitted to the Railway Bureau for permission, of which the following three were sanctioned:—

1. The Nikkan Gas and Electric Company, which maintains a tramway in the city of Keijo, applied for permission to extend the tramway 1.4 miles.

2. The Chosen Electric Company applied for permission to construct an electric tramway running 12.1 miles between the post of Seishin (Chong-ching) and Ranan (Nanam).

3. A private individual applied for permission to construct a tramway (human power) running 0.7 miles between Waikan station and the Rakto (Nak-tong) River in South Keisho Province

PROGRESS IN HOKKAIDO

An interesting account is given in the *Chugai Shogyo* (translation by *Japan Daily Mail*,) by a Seiyukai member of the Diet of the recent development of agriculture and industry in the Hokkaido. The industrial activities in the island comprise mining, agriculture, fisheries, cattle farming, and forestry. According to the latest reports available the profits these industries bring yearly to the people of the Hokkaido amount something like 114,760,000 yen. The yearly income of the farmers at present amounts to 50,000,000 yen. Their activities are chiefly directed to the production of raw materials for alcohol distillers, hemp weavers, beer brewers, oil extractors, and millers. They also supply tinned peas and condensed milk. The brewing industry in the Hokkaido is now acquiring considerable importance.

Miners in the Hokkaido earn something like 8,290,000 yen a year. The annual output of coal amounts to 2,500,000,000 tons in round figures. The veins are inexhaustible and can be worked almost to the end. Of late petroleum has been discovered in the island. Though the International Oil Company has withdrawn from the field on the failure of their trial boring the Nippon Oil and Hoden Oil Companies, and Mr. Marai still remain. According to latest reports to hand their persistent efforts are about to be crowned with success.

In the early days of Meiji sheep rearing was tried, but it ended in failure. Since then careful study has been made of the question, and now sheep breeding is extensively carried on in the Hokkaido. It is hoped that the import of wool, which amounts to 50,000,000 yen yearly, will be checked altogether at no distant date.

The Hokkaido is regarded as one of the three greatest fishing stations in the world. The yearly catch in its waters is valued at 26,000,000 yen. The herring catch this year reached a record. The market for the fish is chiefly in China.

Forestry yearly brings in a profit to the amount of 10,940,000 yen. The export of timber is valued at some 5,000,000 yen. Paper manufacture in the Hokkaido has made remarkable development of late years. In 1898 the mills in the island turned out only 100,000 yen worth. Four years later the output increased to 3,300,000 yen. This year it is expected they will turn out some 5,000,000 yen worth by the end of the year.

The prospects of the hemp weaving industry in the island are also very promising. Several years ago the area under hemp stood at only 4,000 chobo. This year the figures have risen to 9,400 chobo. The greater part of the output is exported. Peppermint growing in Kitami province has also a promising future. The yearly export is said to amount to 1,200,000 yen.

RAILWAYS OF THE WORLD

PROGRESS AND DEVELOPMENT IN TWO DECADES

The "German Empire Statistical Year Book" for the year 1913 contains an interesting survey of the development of railways throughout the principal countries of the world from the year 1890 to 1911, that is to say during a space of two decades.

In the year 1890, Germany could boast of by far the greatest extent of railway lines, although there were other countries in which the railway net was denser. The entire length of railway lines in Germany amounted to very nearly 43 thousand kilometers. Second in order came France with 37 thousand kilometers of railway lines, about 6,000 kilometers less than Germany. These two countries were followed by Great Britain with 32 thousand, Russia with 31 thousand, Austria-Hungary with 27 thousand and, a long way behind, by Italy with 13 thousand kilometers of railway lines. Among the smaller countries of Europe, the only ones with any length of railway line were Spain with about 10 thousand, Sweden with 8 thousand, and Belgium with 5 thousand kilometers. The latter land, with its 5 thousand kilometers, possesses the densest railway net of any country in Europe, as it has nearly 18 kilometers of railway line per hundred square kilometers of land surface. No other country in Europe comes anyway near these figures.

At the end of 1911, Germany still headed the list of European States with 62 thousand kilometers of railway line. Then followed Russia, which only took fourth place in 1890, with 61 thousand kilometers, and immediately behind came France with 50 thousand kilometers, having thus passed from the second to the third place in the list, Austria-Hungary came fourth with 45 thousand, and Great Britain, which took the third place in 1890, with 32 thousand kilometers, has now sunk to the fifth place with 38 thousand kilometers. At the tail of the list of European countries comes Italy, in which land the length of railway line has only increased to the extent of some 4 thousand kilometers in the course of the 21 years lying between 1890 and 1911. Little Belgium has once more added greatly to its existing railway lines, and could in 1911 boast of some 8,700 kilometers, so that she now has 29 kilometers of railway line to the hundred square kilometers of land surface, thus continuing to own the densest railway net in the world.

It is evident that a dense railway net forms a very important factor in the scheme of military mobilisation, for the greater the number of existing railway lines, the more rapidly and easily can troops be brought to the frontier. This is not a very important matter for Belgium, which is a neutral country, but for the Great Powers of the Continent, everything that tends to enable masses of troops to be concentrated at short notice is of the greatest importance for the safety of the country. But this really only holds good for the Continent, for Great Britain, being an island, need not attach so much importance to this particular point in its scheme of defence as must Germany, Austria-Hungary, Italy, France and Russia. Of the five Continental Great Powers, Germany now possesses the densest net of railway lines, having 11.4 kilometers of line to the 100 square kilometers; then comes France with 9.3, Austria-Hungary with 6.6, Italy with 6.0, and Russia comes last with 1.1. We see, therefore, that Russia, despite the fact that she has nearly doubled her railway lines in the course of twenty-one years, will still require a far greater space of time in which to concentrate her troops on the frontier than her two neighbours—Germany and Austria-Hungary.

When we come to consider America, naturally the railway lines of the United States play the most important part. As long ago as the year 1890, the great Republic had 268 thousand kilometers of railways, that is to say 45 thousand kilometers more than the whole of Europe together. By the year 1911, the United States railways covered 397 thousand kilometers, making 59 thousand kilometers more than the whole of Europe. In spite of these figures, the railway net work of the United States, which has a density of 4.3 kilometers per hundred square kilometers, is far behind that of all the great European countries, with the solitary exception of Russia. The railway lines of the great South American Republics have also undergone a vast development in the course of the 21 years in question. For instance, Brazil has increased her railways from 9,500 to 22,000 kilometers, Chile from 3,000 to 6,000, Uruguay from 1,100 to 2,600. But the Argentine Republic can show a far greater increase during the 21 years in question, i.e. from 9,800 to 31,600, an increase of more than three-fold. In Asia, the only country that had any railway communication of importanee in the year 1890 was British East India with 27 thousand kilometers, as, at that time, the railway lines of the whole of Asia only covered about 34 thousand kilometers. From this we see that, in those days, 4/5 of the railway lines of Asia belonged to British India. But the figures for the end of 1911 record an entirely different picture. It is true that the railway lines of India have increased to 53 thousand kilometers during these 21 years, but all Asia can now boast of 105 thousand kilometers of railway lines, so that India only owns about 50 per cent. of the entire railways of this Continent. In the meantime Siberia, which had no railways at all in the year 1890, has constructed 11 thousand kilometers of lines; China has 10 thousand and Japan has developed her railways from 2,300 to 10 thousand kilometers. In the year 1890 the railways of Asia Minor only covered 800 kilometers, whereas by the end of 1911 the amount quoted is 5,000, so that here too great progess has been made. In the year 1890, Africa had fewer railways than any other Continent, the actual figures being 9,400 kilometers. In the course of the 21 years in question, the railway lines of this latter Continent have increased more than four-fold, the actual length of lines now amounting to 41 thousand kilometers. In the year 1890, the German, French, English and Portuguese colonies in Africa had between them only 910 kilometers of railway. By the end of 1911, these figures had increased to 11 thousand kilometers; from this it will be seen that the European Powers are accomplishing a great work of progress in this direction; more especially are we struck by this fact, if we bear in mind that the 11 thousand kilometers quoted do not include the railway lines of the most important Colonies of France and England, i.e. Algiers and Tunis and United South Africa.

Since the year 1890, the railway lines of Algeria have increased from 3 thousand to 6 thousand kilometers; in like manner the railways of Cape Colony have doubled themselves, the figures showing an increase from 3 to 6 thousand, in the case of Natal, the railway lines have grown from 500 to 1,800 kilometers.

Of all the Continents, Australia shows far less rapid railway development, during the last twenty-one years than any other country. In the year 1890, the railway lines of Australia covered nearly 19 thousand kilometers, and by the end of 1911 the figures amounted to 32 thousand. We see therefore, that the Australian railway lines have not nearly doubled their extent in the course of these twenty-one years, whereas those of Asia have increased three-fold and those of Africa four-fold.

The total length of railway lines throughout the entire world, in the year 1890, amounted to 617 thousand kilometers; by the end of 1911, these figures had increased to nearly 1,100,000. All these figures show that the most important existing means of communication has developed in a most remarkable manner, throughout the entire world, in the course of the period in question.

GAS ELECTRIC RAILWAY TRAIN

On the line of the Pittsburg and Lake Erie Railroad Company a train consisting of a gas electric motor-car, by the General Electric Company, of Schenectady, and a trailer built by the Wason Manufacturing Company, of Springfield, Mass., has been in operation for nearly a year. It runs on the main line between the ordinary steam-driven train, and is being utilized for local passenger service between Pittsburg, Pennsylvania, and the town of College. The distance between Pittsburg and College is just over 31 miles, and the run includes three stops. It has been found that the train can average 50 miles an hour, and the actual times recorded between the terminal stations with three stops have been as low as 49 min., while with two stops the distance has been covered in 42 min. The placing of this train between the ordinary steam trains implies considerable confidence in this method of equipment, as the line is used not only for a heavy passenger service, but also a large goods traffic, and any interruption would have serious consequences.

The train is equipped with motors of a total horse-power of 200, and the motor-car, which seats 42 persons, is 42½ft. long and 10ft. 5in. wide It is rather shorter than the usual gas electric motor-car as developed by the General Electric Company, because it has been designed especially for use with a trailer. This trailer is 38ft. long over the body and seats 80 people. The motor-car has a rear-platform entrance, and the trailer has platform entrances both at the rear. The motor-car has three sections, of which one is a smoking department, the second, 12ft. long, is a front cab in which the engine and dynamo, controller, etc., are installed, and the third, 6ft, long, is for luggage. The total weight of the motor-car is 36 tons, and that of the trailer 22 tons, so that there is a good distribution of weight over the total wheel base.

SURFACE-OILED ROADS IN THE PHILIPPINES

The use of a surface treatment of oil on the macadam roads of the Philippines is reported in the "Quarterly Bulletin" of the Bureau of Public Works as proving satisfactory even under comparatively heavy automobile traffic where proper attention has been given to the methods of application of the oil. Experiments have been conducted on small areas for some time and a study of the results of previous practice has led to several changes. Oil was applied to about 4⅛ miles of the Manila-South Road last January. Preparatory to the surface treatment of the oil the road was broomed, but only the finer portion of the material was removed. No water was applied, as was done before, and the oil, spread in quantities approximately ⅛ gal. per square yard, was allowed to stand for thirty to seventy-two hours, until the surface was dry, before being covered with dredge-run gravel. Previous practice had been to cover it with sand from three to five hours after the oil application, and in this way much of the binder was absorbed by the sand covering and thorough penetration of the road base was prevented.

It has not been found necessary to use road rollers after the gravel has been spread, as the local traffic seems to consolidate thoroughly the binder and the surfacing. Previously the asphalt-like surface was oftentimes too thin to stand the traffic and would break through after a few months of use. Now there is no dust raised by the fastest moving automobile.

THE WOODS OF THE PHILIPPINES

A great deal has been heard but little known in the United States of the rare and beautiful hard woods of the Philippine Islands, and some of the stories told may have suggested that the imagination had not been neglected, but a practical demonstration that these stories were founded on fact may be found in the offices of General Frank McIntyre, Chief of the Bureau of Insular Affairs, at Washington, where there has been received from the Islands enough furniture to furnish two office rooms. Many persons have called out of mingled interest and curiosity and have critically examined this furniture in admiration that could not be suppressed.

About a year ago, as the story goes, it occurred to the Insular Bureau, which has charge of the affairs of civil government in the Philippines and Porto Rico as well as of the affairs of the customs receivership of Santo Domingo, that it would be a good idea to have in Washington, for the inspection of visitors and others interested in the far away islands, an exhibit of one of their valuable resources. This idea prompted the thought that the exhibit might be made useful as well as ornamental, and it was therefore decided to have made in the Philippine Islands, out of the native hard-woods and by native workmen, enough furniture for the rooms in the War Department building occupied by the Chief of the Bureau of Insular Affairs to show the possibilities as well as the beautiful color and grain of the Philippine hardwoods.

The Governor-General of the Islands was consulted and gave his prompt and hearty approval, and the action necessary to put the thought into effect was taken at once. Drawings and specifications as to dimensions and style were prepared in Washington and forwarded to Manila, and officials regard it as a compliment to the American instruction as well as the native mechanical dexterity that these drawings and specifications were followed down to minutest detail and nothing added or omitted. The furniture was shipped half way round the world and recently arrived in exceptionally good condition. It is made of red narra, or Philippine mahogany, and is of a light claret color shading to slightly darker, has a natural finish with high polish, and is strikingly grained.

This furniture shows the ability and dexterity of the natives in their work as well as their capacity to learn. They turn out only manufactures of the best quality and of the highest grade of workmanship. They depend entirely on local material for their output, and the Filipinos are taught the value of native raw material and products.

The policy of the government from the very beginning has been one of preparing the Filipinos for industrial efficiency. In the schools this is particularly noticeable. Due to the favorable system of organization, an industrial and vocational program of education has been put into operation which reaches down into the very primary grades of the public schools and starts the boys and girls on an industrial career that turns them out productive members of society.

In addition to making use of the fine native lumber found in such abundance, other products of the country, the existence of which in many cases was scarcely known to the Filipinos much less their commercial value appreciated, have been put into the hands of the pupils in the schools and under the guidance of the native teachers and the supervision of the American teachers made into products for the markets of the country.

In the variety of natural colors and multiplicity of shapes and uses no baskets in the world can surpass those produced by the pupils of the public schools of the Philippines. They make hats in durability and texture equal to the Panama hat. Indeed, many of the so-called Bangkok hats came from the Philippine Islands. The Filipino girls of the public schools make lace and embroidery which equals the finest quality of hand-made product of Europe. Many other products such as mats, slippers, cloth, etc., more local in character, are made in the industrial classes of the public schools.

A noted educator from the United States, after inspecting the work of the Philippine schools and the industrial features in particular, remarked that, "Other nations one of these days will be coming to the Philippines to see how the educational triumphs have been won."

Bilibid prison at Manila is considered one of the best industrial schools for adults in the world. It is not convict labor in the accepted sense of the word. Very early in the history of American occupation of the Philippine Islands an industrial department of Bilibid prison was established. Each prisoner is permitted to select such employment as he can best do; otherwise he is assigned to some work, but each one must learn a trade or vocation. It takes them away from their old environment for several years where they might become confirmed criminals, a menace to society, and a burden to the administration. Most of them went into Bilibid prison irresponsible and incapable and are turned out efficient workmen and law-abiding citizens of the community in which they live.

As a relic of Spanish times all the woods in the Philippines are divided by law into four groups. The grouping has been slightly changed since American occupation, but it still fairly represents the preference of timber users. Narra is always placed in the first, or highest, group in the classification of the woods of the islands and is of a singularly rich and beautiful color.

Narra is among the very highest priced woods because of its beautiful color, durability and adaptability. The Philippines produce harder and better woods for exterior work, but they do not furnish anything superior for interior decoration or furniture. The wood of narra is moderately heavy, moderately hard, very durable, and is seldom, if ever, attacked by the anay (white ant). It seasons well when properly treated and takes a fine finish. The hard wood of narra is white, yellow or red, and the sapwood nearly white. The grain is rather fine, but irregular, and very beautiful when quarter sawn. Narra is used principally for fine furniture, cabinet-making and interior house trim. The provinces of Cagayan, Mindoro, Tayabas, Albay, Isabela, Moro and Sorsogon lead in the production of narra.

Narra is divided commercially into two varieties, called Red and Yellow. So far as is known, this division is not a specific one, but a difference due to the habitat in which the tree grows. Both species have the red and yellow varieties. The red grows in the hilly country, near the streams generally, and the yellow is found in the flats near the seacoast.

Slabs are obtained from the buttresses of narra, from which large one-piece table tops are made. These are sometimes 6 feet and over in diameter. Narra wood is often finished in its natural color and sometimes stained brown or dark red.

This class of wood, formerly very popular for pianos and high grade furniture, is becoming very scarce in the United States and is much imitated by stains or veneers. It is not generally known that there is almost an inexhaustible supply under the jurisdiction of the American government on which no import duty need be paid.

It has been estimated that there are as much as 40,000,000 acres of public forest lands in the Philippine Islands. The Director of Forestry says in a report:

"In a recent visit to the southern islands of this group I was impressed with the amount of timber standing on the smaller islands; frequently the topography was such that it could be exploited with facility. I saw tracts of virgin forest where more than 10,000 cubic feet of magnificent timber per acre was standing; trees 150 feet in height, with trunks clear of branches for 80 feet. There are many millions of cubic feet of timber in these forests that should be cut in order to properly thin out the dense growth; for instance, where there are three or four trees growing on a space required for one, that one so freed would put on more good wood each year than the four together.

"It is safe to state that the number of native tree species found will be nearer 500 than 450, a great majority of these undoubtedly being hard woods. The edges of the great forests have been scarcely cut away and 50 valuable hard woods given to the world, the full value of which species has not been demonstrated as yet. 665 native tree species are now listed.

Some idea of the present and potential value of the islands in hard wood alone may be gained from the bare statement that there is enough hard wood standing in the virgin forests of the islands several times over to pay for their original cost to the United States even if sold at only a nominal price per acre.

NAIL TRADE IN JAPAN

Until recent years there were no nails manufactured in Japan, and the imports of nails amounted to over 600,000 casks yearly. The demand for nails increases yearly, and the Government, hoping to stop the volume of these imports, recently increased the duty to 1.25 *yen* a cask, and at the same time ordered the Wakamatsu Iron Foundry to manufacture wire to be used in the manufacture of nails. The Wakamatsu Iron Foundry installed nail-wire making machinery, and soon after this the Yasuda Company began manufacturing nails at Yawata, Kyushu, and in Tokyo, on a large scale, using the wire manufactured by the Government Foundry. The Kishimoto Company, of Osaka, seeing this business to be a profitable one, established a nail factory at Amagasaki, near Osaka, and this factory and the two factories of the Yasuda Company are now working at full speed in order to supply the demand. The capacity of the two Yasuda Company factories is 20,000 casks monthly, and the capacity of the Kishimoto Company is 12,000 casks monthly; a total of 32,000 casks monthly and 384,000 casks yearly. This number is only about two-thirds of the total amount annually imported.

The authorities blame the excess of imports on the inability of the Wakamatsu Iron Foundry to supply all the wire needed by the three nail factories. These factories are capable of producing much more than they are at present turning out, and as it is said that the Wakamatsu Foundry will soon instal more machinery for the manufacture of nail wire, it is expected that the quantity of nails manufactured at home will soon equal the demand for them, and thus a large item in the unfavourable balance of imports will be cancelled, and import of nails in a few years be completely stopped.

The progress of this manufacture during the past few years illustrates the remarkable advance of Japanese manufacturing industry. If such advances continue to be shown in other branches of manufacturing business the time is not far off when Japan may enjoy complete economic independence.

The *Echo de Tientsin* publishes the details of a new limited French Company started in Shanghai, called La Société Franco-Chinoise de Batellerie et de Cabotage en Chine, of which Messrs. Nicolas Tsu, J. O'Niell, and Henri Bourbonlon, all of Shanghai, are the first directors, and Messrs. Henri Charrey, Architect, and Louis Tsu, secretary to the compradore of the Banque de L'Indo-Chine, at Shanghai, are the first managers. The capital is Tls. 40,000, and the company will employ vessels in the coasting trade.

THE LODGE AND SHIPLEY "SELECTIVE HEAD" LATHE

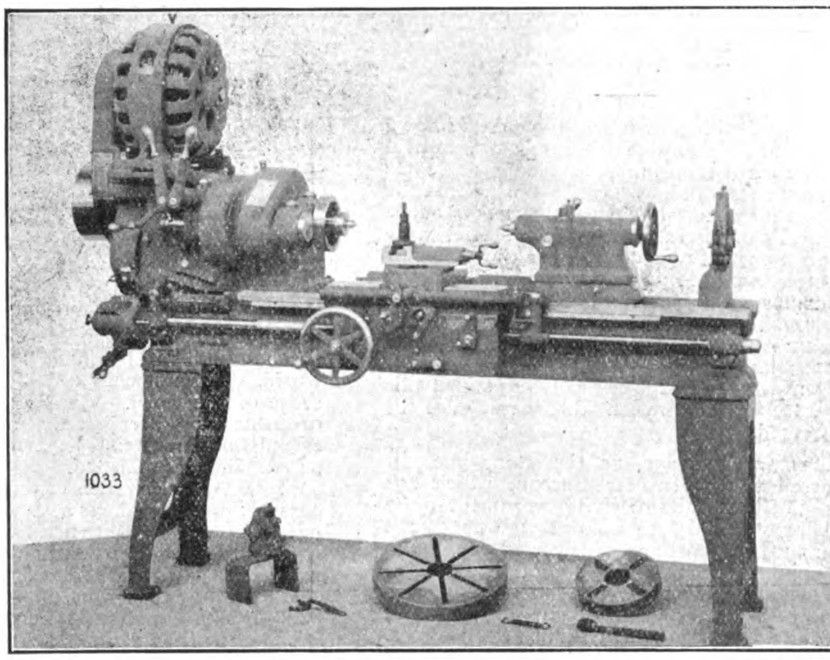
To combine strength, simplicity and durability, the *selective* type automobile transmission has been adopted for the gear box drive of the new Lodge and Shipley "Selective Head" lathe; this permits any one of the spindle speeds to be *selected* instantly—hence the name "Selective Head."

A constant speed single driving pulley running at a high belt velocity delivers an excess of power to the cutting tool under all conditions. As the diameter of the work increases the gear ratios and the torque proportionately increase. Thus lathe work requiring a maximum amount of power can most advantageously be handled in the Lodge and Shipley "Selective Head" lathe.

Power is transmitted through hardened steel gears mounted on shafts running in ball bearings. This eliminates the great frictional loss in journals and by soft gear teeth common to all other types of single pulley heads. As the result of these and other refinements the "Selective Head" attains an exceptionally high mechanical efficiency. Wear of gear teeth and of bearings is reduced to a minimum, which makes it possible to produce nicely finished work free from gear marks.

Headstock Casting:—The headstock is made of box section, with the sides extended up to the center line of the spindle, which makes an unusually rigid casting. Further stiffness is added by the internal bracing with both longitudinal and cross ribs. The back of the headstock is planed to receive the gear box which is made as a separate unit. Covers totally enclose all gearing.

Spindle Speeds:—There are six speed changes in the gear box. From the gear box the drive is either direct to the spindle or through shifting back gears in the headstock proper, giving twelve spindle speeds in all back geared lathes from 14" to 27" both inclusive. The 30" and 36" lathes can be provided with triple gearing when so ordered, and this gives eighteen speeds. These two sizes are also furnished without triple gearing, and they then have twelve changes of spindle speed. In the triple geared lathe there are six speed changes by direct drive from the gear box, another six changes through the back gears and the third set of the slowest six speeds is obtained through the triple gearing driving into the internal gear of the face plate. On the 42" and 48" machines the triple gearing is always supplied in order to get the speeds sufficiently low to accommodate the large diameters.



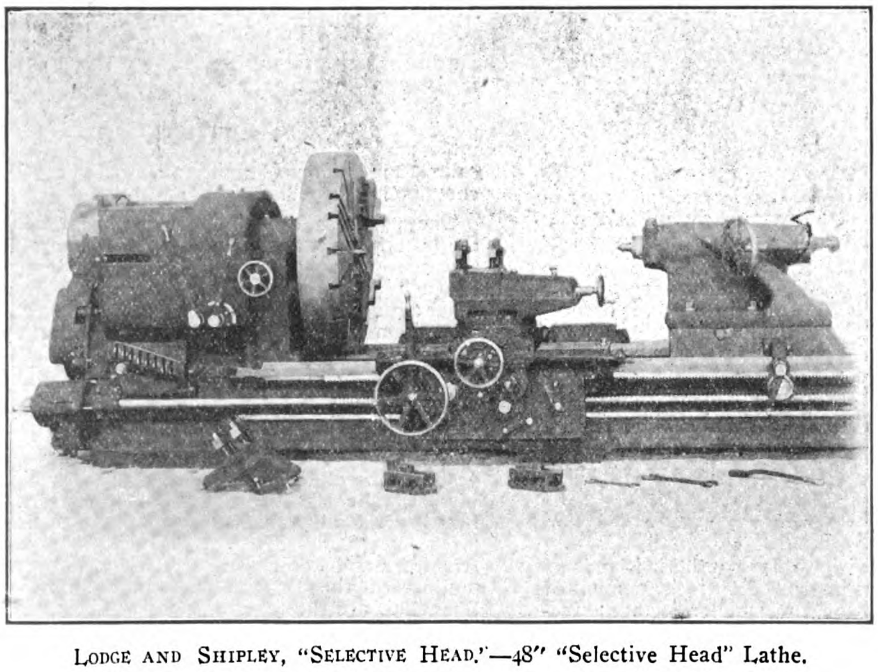
Lodge and Shipley "Selective Head."—14" Motor Driven "Selective Head" Lathe. Constant speed motor is mounted on the head and direct connected through spur gears.

Friction Pulley:—An extended flanged hub attached to the gear box carries the driving pulley and thus relieves the driving shaft of all belt pull. Inside the pulley are two frictions, one of which drives the initial shaft direct, while the other drives it at a back geared speed. The friction is at the initial point only, to insure a powerful drive, and the friction will easily slip the belt. The ratio of the direct speed to the back geared speed is about 2.6 to 1. This is approximately the ratio between the finishing and roughing speeds on a given diameter of work; therefore, in order to increase the speed from a roughing to a finishing cut, the gear shift does not have to be made, but it is only necessary to shift the friction lever from one side to the other.

The friction pulley is entirely enclosed at its outer end to retain the oil for the friction surfaces. A combination oil and belt guard is provided at the inner edge to prevent throwing oil on the belt.

Transmission Gears:—All gears within the gear box are of the stub tooth 20 degree pressure angle type. They are made from chrome nickel steel, heat treated and hardened. After hardening the bores of the gears are ground concentric with the pitch circles; finally the gears are mounted on an arbor in a special machine where the teeth are lapped, so that any distortions in the hardening are removed. This insures perfectly true gears, easy rolling action and noiseless operation from the first.

Chrome Nickel Steel Gears:—All of the transmission gears in the gear box are made from chrome nickel steel, heat treated and hardened. This gives a tensile strength of about 260,000 pounds per sq. in., an elastic limit of about 246,000 pounds and a sclerescope test of "seventy degree" hardness. This produces a gear of fibrous structure and exceptional strength and resiliency. It not only results in practically indestructible gearing, but also reduces the frictional loss in transmission because of the great hardness of the gear teeth and the splendid wearing surfaces which they present to each other.



Lodge and Shipley, "Selective Head."—48" "Selective Head" Lathe.

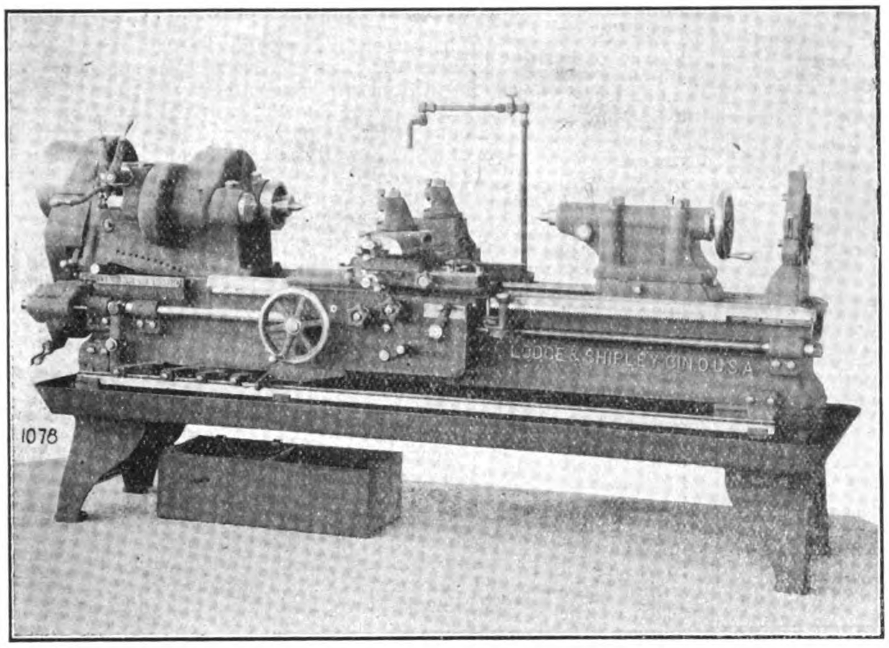
Gear Box:—The entire speed changing mechanism except the back gears of the headstock proper is contained in the gear box which is an independent unit tongued and bolted to the back of the headstock. It may be removed at any time without affecting the other parts of the head, or without removing the motor in the case of a motor drive. The gear box is oil tight and dust-proof. The gears run at all times partly submerged in oil.

The initial shaft of the gear box, which has either direct or back geared speed, transmits power to the driven shaft through sliding gears. There are three speed changes to the driven shaft by these sliding gears, which, with the two speeds of the initial shaft, give six changes of speed obtained within the gear box. The initial shaft in the gear box which receives the slidling gears has its four keys formed upon it. There are no screws or cotter pins inside the gear box, nor any other small parts which might work loose and get into the running gears.

Ball Bearings:—Both shafts in the gear box in all sizes of lathes are mounted in anti-friction ball bearings. Threaded dust plates retain the ball bearings in their respective seats and prevent the admittance of dirt or grit to either the ball bearings or the gear box. No shaft runs at a higher rate of speed, even in the small lathes, than 375 R.P.M. This comparatively low rate of speed and the anti-friction properties of the ball bearings help maintain an exceptionally high efficiency of transmission.

Speed Control:—The six speeds provided by the gear box are obtained through two vertical levers, conveniently located on the front of the headstock. The lever nearest the operator controls the two frictions in the driving pulley and stops, starts and gives fast and slow speeds by moving the lever to the right or left. The other vertical lever shifts the gears and must be moved to the right or left and also in or out to select the required gear. The horizontal lever operates both a positive stepped clutch on the spindle and the sliding back gear pinion which is interlocked with the clutch so that both cannot be engaged at the same time.

A plate on the front of the headstock gives a complete list of all speeds and position of levers for obtaining them.



LODGE AND SHIPLEY, "SELECTIVE HEAD."—18" Belt Driven "Selective Head" Lathe with manufacturing equipment of multiple stops for length and cross feeds, pan, pump, tubing and connected compound and plain rests.

Back Gears and Triple Gears:—The back gearing is located at the front of the head stock. The back gear shaft and pinion in lathes from 14" to 36" sizes both inclusive, are cut from a single steel forging. The teeth of the pinion are hardened. The shaft is journaled in continuously lubricated bronze bushings. The triple gear is operated by a hand wheel which slides the triple gear pinion into or out of mesh with the internal face gear. All headstock driving gears are of steel, and as previously explained, gears subjected to the most wear are of chrome nickel steel heat treated and hardened. On all lathes, the gearing is designed to give practically uniform speed progression throughout the entire speed range.

Spindle and Spindle Bearings:—The spindle is of large diameter and made from chrome nickel steel. The end thrust is taken against the rear housing by alternate bronze and hardened steel thrust washers. The spindle bearings are of special composition white metal, renewable and interchangeable, and are continuously lubricated by wick oilers from large oil wells. These white metal bearings are faced and turned in halves to exact gauge size; the headstock casting is reamed to this same size; the screw holes are drilled by jig.

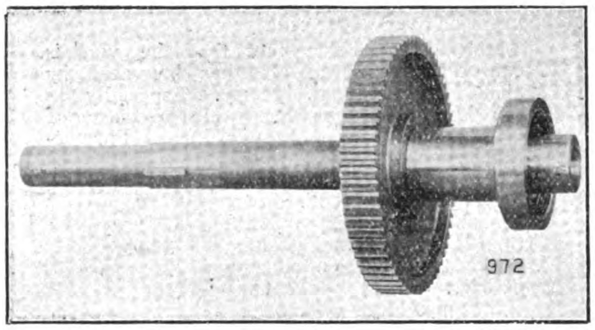
Spindle Nose:—The spindle has a double nose, consisting of an inner cylindrical portion and an outer cup. The cup is threaded internally to hold the chuck plate in position and the end is faced to provide a very large diameter shoulder against which the face plate is tightened. The inner cylindrical portion of the nose is left blank and extends beyond the outer nose, so as to form a pilot to receive the face plate or chuck plate. This pilot at all times accurately centers the chuck plate and by centering the bore of the chuck plate before the threaded portion is reached, insures that the threads engage easily and that the chuck plate may be readily drawn squarely against the face of the outer nose.

It is a comparatively easy matter to accurately fit a chuck plate to this spindle, as the bore may be reamed standard size to fit the pilot and the thread is used only to hold the plate in position against the face of the cup. The threading of the chuck plate is easily done, as it is a job of external chasing. The large diameter of the shoulder afforded by the cup prevents the face plate becoming stuck to the spindle nose and makes it always an easy matter to remove the face plate or chuck.

Spindle noses of "Selective Head" lathes from 14" to 20" both inclusive are made to the same standard, so that chucks will interchange from one lathe to another between these sizes. Similarly another standard is used for all lathes from 22" to 36". As the larger lathes are triple geared, there are but the two sizes of spindle noses for the entire range of lathes.

No countershaft is necessary with this lathe if the machine can be placed near the line shaft. Drive may be either with straight or quarter turn belt.

If a countershaft is required, either a single speed plain tight and loose pulley counter shaft



LODGE AND SHIPLEY, "SELECTIVE HEAD."—Spindle and face gear from "Selective Head" Lathe showing new type spindle nose.

or a double friction countershaft may be furnished.

Motor Drive—Any standard make of motor, either direct or alternating current, constant or variable speed, within reasonable limits of size and speed can be mounted on the top of the headstock and direct connected through gearing. A gear which contains the same friction mechanism as the pulley, is substituted for the pulley at the end of the gear box. A suitable casting is mounted at the end of the headstock cover and carries an intermediate fibre gear running in positively lubricated journals. This casting serves as a gear guard and cover for all of the motor drive gears. A pinion on the armature shaft meshes with the intermediate fibre gear, thus giving a direct drive to the gear box of the headstock.

The user may at any time drive a regular belt driven "Selective Head" lathe from an individual motor placed on the ceiling or on the floor and direct connected to the head stock pulley by a belt constituting the "Simplicity" motor drive. A constant speed motor is generally used for this style of drive.

Lathe Details:—The bed is made from close grain iron of high tensile strength and the top is cast against a chill which makes the top of the bed very hard and dense, greatly increases the life in alignment, and so closes the pores of the iron that dirt and grit cannot become imbedded in the ways to wear the carriage by a lapping action.

The tail stock has floating binders to insure correct alignment of the tail stock spindle; exceptionally long spindle of tool steel; barrel extended beyond the face of the tail stock to afford a firm support to the spindle at all times. Clamping bolts for holding the tail stock to the bed are operated from the top of the barrel. In 22" lathes and larger a pawl on the base of the tail stock engages the rack in the center rib of the bed to afford a positive brace.

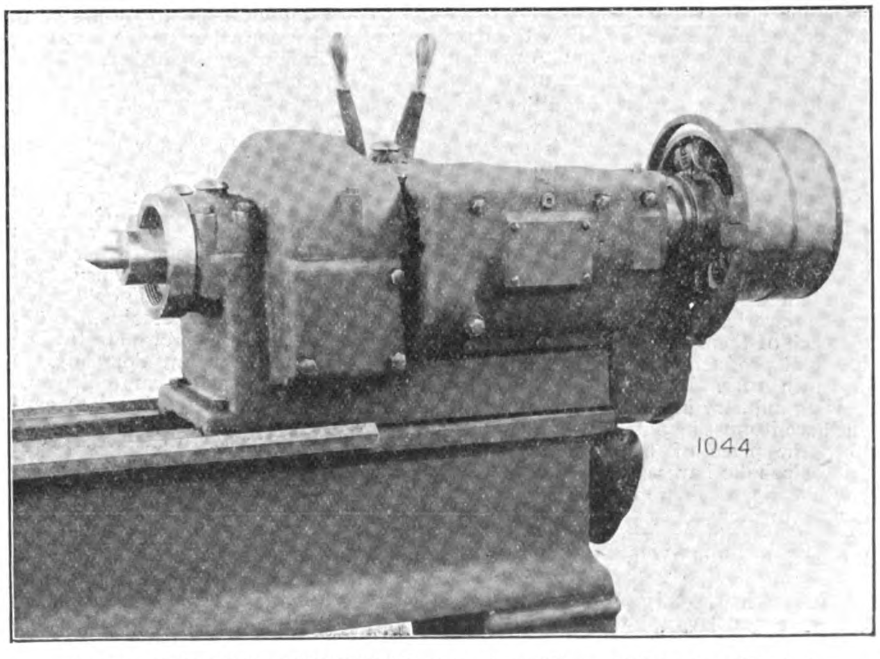
The quick change gears for feeds and threads are of drop forged steel, located beneath the headstock, and firmly supported in the walls of the bed. Changes of feed or thread can be quickly made while the lathe is under cut.

The carriage is gibbed inside and out, has oil trough around the front and rear wings, and the extra wide bridge takes a supplementary scraped bearing against the inside horizontal and vertical flat surfaces of the bed, thus providing a positive support directly in line with the tool thrust.

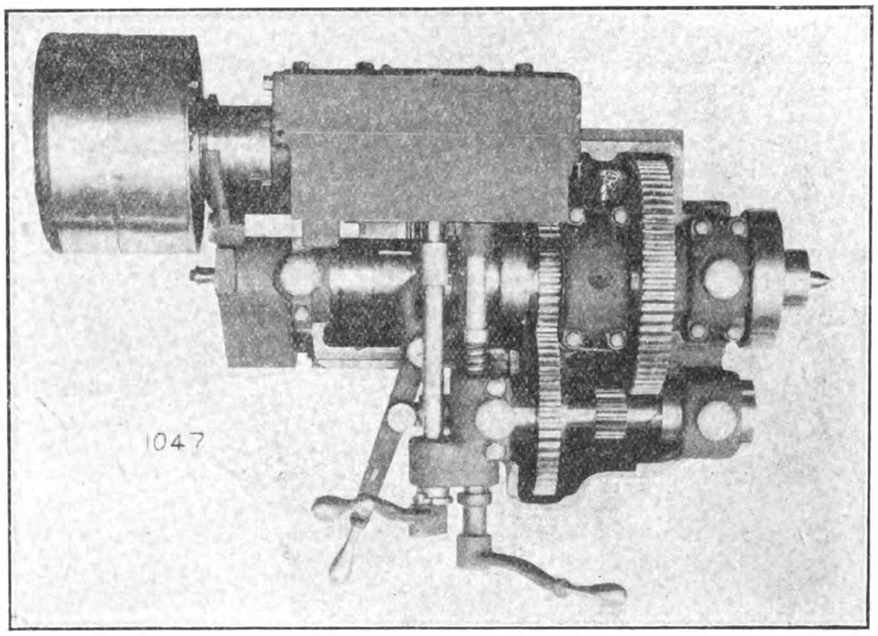
The compound rest has a special square base so designed that the top slide cannot be overhung, which provides a solid metal-to-metal anvil support under the tool to prevent vibration.

The apron is self-contained and double walled with studs supported front and rear. All gearing except the frictions is of steel, and a stub tooth rack pinion insures greater strength.

Manufacturing equipment consisting of multiple stops for length and cross feeds, connected compound and plain rests, pan pump and tubing and a four-way tool block can be furnished with any of these lathes. These are valuable additional appliances for turning repetition work.



LODGE AND SHIPLEY, "SELECTIVE HEAD."—Rear View of "Selective Head."



LODGE AND SHIPLEY, "SELECTIVE HEAD"—Interior of "Selective Head."

THE BREWING INDUSTRY OF JAPAN

In 1876 the Hokkaido Government instituted a series of experiments in the culture of barley and hops which proved so successful that the Government was encouraged to build a brewery at Sapporo where the manufacture of beer was first attempted in Japan.

In 1887 many private companies were organized to exploit this growing business; the Ebisu Beer Company at Meguro, near Tokyo; the Asahi Brewing Company at Fukida, Osaka; and the Kirin Brewing Company at Yokohama, were all built at that time. In 1895 the Kabuto Brewing Company was also established in Tokyo.

Beer had become a popular drink in many parts of Japan, some time before the establishment of this first brewery in the Hokkaido. It had to be imported from Europe, and in 1876 imports reached the sum of 400,000 *yen*. The beer brewed by the Bath Brewing Company, an English concern, was the most popular at that time. In 1887, when so many domestic companies were organized, beer had been imported to the value of 460,000 *yen*. As the production of the home breweries increased the amount imported gradually decreased, until, in the thirtieth year of Meiji (1895), they ceased altogether, and now the only beer imported is some German and American beer which is consumed by the foreign population.

Quite the contrary to conditions in 1876, when the only beer in Japan was imported beer, the present production is so great that the yearly exports of beer are valued at over 700,000 *yen*.

Statistics of production of the different breweries show a total of over 6,760,039 gallons of beer brewed in Japan during 1912. Compared with the other countries of the world this is an insignificant amount. The number of great breweries in the whole world is about 40 and each of them brews in one year more than the total production of all the breweries of Japan in 1912. It will thus be seen that the brewing industry in Japan is still in its infancy. But here it must be noted that in Japan "saké" takes the place of beer which abroad is a cheap alcoholic beverage very popular because it is usually considered a "light" beverage on account of the very small percentage of alcohol which appears in its composition. Since olden days in Japan "saké" has been the drink of all classes of people; it is a cheap liquor and is sold at a price which puts it within the reach of the poorer classes, who, abroad, drink beer, which is, for them, cheaper than wines, brandy, whiskey, etc. In 1912 over 150,000,000 gallons of "saké" were brewed in Japan. Now that there is a campaign against the use of strong liquors, with which "saké" can be classed, in Japan, the brewers hope that the consumption of beer will be increased. But this is much to be doubted if the price of beer does not become low enough to place it within the reach of the masses.

In 1888 the whole amount of beer brewed was only 185,000 gallons, but in 1912 the Dai Nippon Beer Brewing Company exported 330,000 gallons, and the Kirin Brewing Company and the Kabuto Company exported together 70,000 gallons, a total of 400,000 gallons. Since 1887 the increase of production has been over 10 per cent. yearly.

It is a remarkable fact that the world's consumption of beer also has increased by about 10 per cent. yearly. Especially in the United States has this increase of consumption been noticeable. Formerly Germany occupied the first place in the consumption of beer, but now the United States consumes greater quantities than Germany and stands in the first place as a consumer of beer. In 1890 the United States produced over 400,000,000 gallons of beer. In 1910 this amount had increased to over 1,000,000,000 gallons. At the same time the percentage of increase in beer production is keeping pace with the percentage of increase in population. This is to be attributed to the strong temperance movement in the United States which is rapidly causing many people to abandon the use of wines, brandy and whiskey. Their place in the home, restaurant and public bar is being taken by beer.

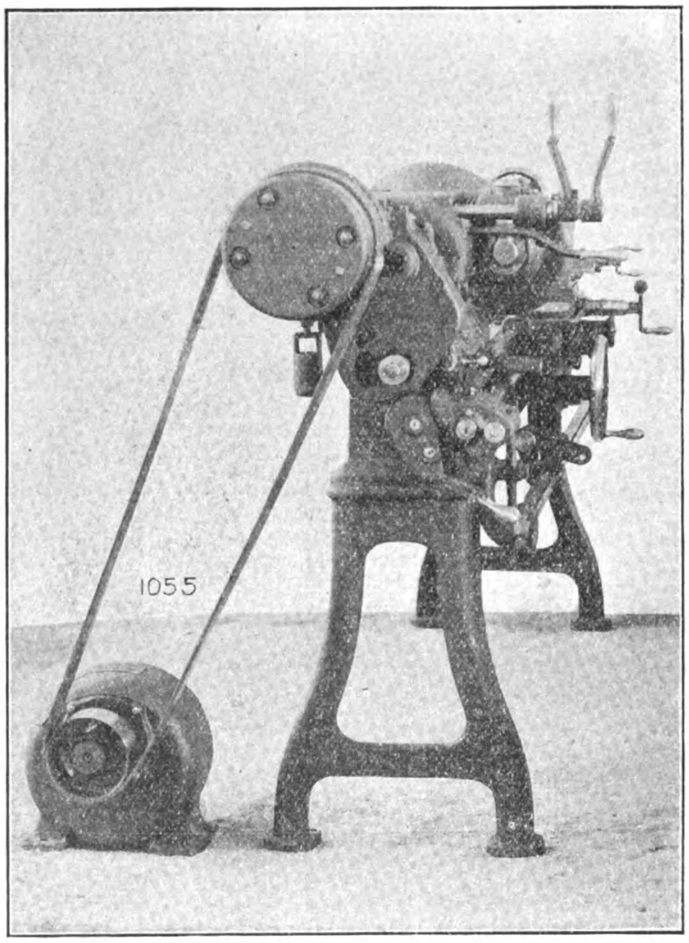
Whiskey, brandy, and "shochu"—a Japanese spirit—have about 40 per cent. of alcohol in their composition; "saké" contains about 15 per cent.; wines only about 10 per cent; while Sapporo, Ebisu and Asahi beers contain only about 4 per cent. of alcohol. Münchener Beer (brewed by the Dai Nippon Brewing Company, the Ebisu, Asahi and Sapporo Brewing Companies also) contains only 6 per cent. of alcohol.

Last year all business enterprises in Japan suffered from the depression caused by the death of Meiji Tenno. The brewing industry was alone exempted from this depression. The increase of 10 per cent. being, as usual, shown in the production of the brewing companies. The first half of 1913 shows an increase of about 10 per cent. in production over 1912.

The present difficulty in the way of increased exports of Japanese beer is the problem of competition with foreign beers. Japanese beer is exported to Manchuria, North and Central China, Asiatic Russia, and to the South Sea Islands, but in all of these places foreign beers are on sale at prices which it is very hard for the Japanese companies to meet. The most formidable competitors in Central and Northern China are the Union Brewing Company at Shanghai, and the Tsingtau Brewing Company at Tsingtau. The Dai Nippon Brewing Company has a branch office in Shanghai where it has been notably successful in competition, forcing the Union and the Tsingtau Brewing Companies to lower their prices, and this company has gradually extended its business until it has about two-thirds of the barrel beer trade in its hands. This company is also successfully monopolizing the sale of bottled beer. In South China Japanese beer is making successful progress; the German brewery and the Orient Brewing Company of Hongkong are the only competitors in that market that have been difficult to compete with. In Singapore, the Malay Peninsula, Java, and Sumatra, Japanese beer is making successful progress together with other goods of Japanese origin.

The exports of beer are gradually increasing and the breweries are preparing to increase their productive capacities in order to raise their production to over 10,000,000 gallons, to which amount it is expected the export trade will reach within a very few years.

Up to a few years ago the Dai Nippon Brewing Company used Australian and German malt, but now this company is buying only home-made raw materials. The quality of the home-made malt is excellent, and some of it is even said to surpass the foreign imported malts.



LODGE AND SHIPLEY, "SELECTIVE HEAD."—16" "Selective Head" Lathe with "Simplicity" motor drive. Motor is placed on floor and belted direct to the regular driving pulley.

OIL FIELDS IN TIMOR

The following information regarding these oil-fields has been furnished to the *Hongkong Daily Press* by Mr. Theo. Bunje, of Hongkong:—

During the last few years considerable interest has been manifested in the development of petroliferous land in the Island of Timor. Timor Island is situated 9 degrees S. lat. and 125 degrees E. long. It is 263 miles in length, and its greatest breadth is 60 miles. The island is about 2,100 miles from Hongkong and 436 from Port Darwin (the nearest Australian port). The Eastern half of the island belongs to the Portuguese Government and the rest to the Dutch.

The International Petroleum Co., Ltd., Hongkong, holds several oil concessions in the Portuguese portion of the Island. Each concession comprises an area of about 1,250 acres, or 2 square miles. In one of the concessions five miles from the sea coast oil was obtained at a very shallow depth. The oil is of a brown colour, very fluorescent without any disagreeable odour and yields a high grade petroleum. Tested by the Hongkong Government Analyst it showed a flashing point (Abel close test) of 112 degrees F., specific gravity of .8403.

Boring down to a depth of 240 feet, with up-to-date American machinery and tools, a very strong flow of petroleum gas was experienced, strong enough to raise water, which is used for drilling in the pipe to a height of 200 feet.

One of our experts and drillers remarks in his report that there is an immense body of oil underlying the land in which the gas has its origin, and the oil is of a very high gravity.

The gas is merely the escape of the lighter properties of the oil, and it is only the high grade oil that contains the lighter properties in sufficient quantities to throw off a flow of petroleum gas.

In another of the International Petroleum Co., Ltd's., concessions also on the South coast of the Island and about eight miles from the sea, large pools of viscid black oil were found, with a flash point (Abel close test) 163 degrees F. This oil is very suitable for fuel oil. Immense quantities of lime-stone coated with bitumen and ozokerite cover the ground and yield from 100 parts by weight the large amount of 24 parts of crude heavy petroleum oil, having a specific gravity of .9547 at 15.5 degrees C. A very interesting report appears in *The Petroleum Review* of September, 1913, by Mr. E. J. Green, General Field Manager for the Timor Oilfields, Ltd. On several occasions I had the pleasure of meeting Mr. Green in the Island of Timor, and I can fully verify the following extracts from his report:—

"The Island of Timor is divided in about equal proportions between the Dutch and Portuguese Governments, the Eastern portion of the Island being Portuguese.

"Very little is known at present concerning Dutch Timor, owing to lack of encouragement from the Government, while prospecting by private individuals is prohibited.

"Fortunately this is not the case where Portuguese Timor is concerned, foreigners of any nationality receiving every courtesy and every possible assistance from the Government.

"Petroleum has been known to exist in the Island for a long time, one of the earliest references appearing in Wallace's "Malay Archipelago," written over 50 years ago.

"There has been recently many large areas of petroliferous land located, and acting upon geological advice, deep boring is now in progress. A number of concessions are held by various companies, the largest single concession (Pualaca Concession) being situated in Central Timor; and other properties being either on or adjoining the south coast.

"Even at comparatively shallow depths good shows of petroleum have been met with, and considerable quantities obtained by pumping. When, however, drilling is carried down to a depth of from 1,200 to 1,500 feet, I confidently anticipate that good flowing wells will result.

"A sample of petroleum taken from the surface has proved to be of high commercial value, containing as much as 64.6 per cent. of kerosene and over 30 per cent. of intermediate lubricating oils. It is highly probable, therefore, that ultimately Timor petroleum will prove to be the most valuable obtained in the East Indies.

"The country is mountainous throughout, but is well served with roads which are being rapidly extended.

"Although within a few degrees of the equator, the climate in the interior is an ideal one for Europeans, enabling oilfield work to be carried on without jeopardising the health of employees.

"Labour conditions cannot fail to attract the notice of a new-comer, wages being exceedingly low (20 Mexican cents per day, or 5d. per diem, for unskilled labour), without recruiting or any other expense, all that is necessary being to notify the local military commandant the number required, and within a few days the men are all forthcoming.

"Beyond Customs charges and necessary licences, there is no taxation on either property or income.

"There is a small statistical tax of 1 per 1,000 on imported machinery, and a nominal royalty on all oil exported, but this is more than compensated by the rebate which is allowed on colonial products imported into Portugal.

"As regards the natives, it may be stated that the Timorese are more Papuan than Malayan, but their colour is somewhat lighter and they do not possess such prominent features.

"They are divided into many small tribes, are very warlike and speak a variety of languages, no less than forty-two dialects being known in Portuguese Timor alone.

"At the time of writing, four companies have secured concessions, and no less than three are carrying out active development. The first company to acquire territory was the Timor Development Syndicate, of Sydney, whose land is situated at Vessora, on the South coast. Acting upon the advice of its geologist, a deep bore is now being put down, and, if necessary, this well will go down to a depth of 2,000 feet.

"The only English company is the Timor Oilfields, Ltd. It is generally conceded that this company possesses not only the largest but also the most promising territory in the island, and under my direction all pioneer work has been carried out, everything being now in readiness for deep boring.

"The next company of importance is the International Petroleum Co., Ltd., of Hongkong, and the latest company to direct its attention to Timor is the Bibiluto Oil Wells, Ltd., of Sydney, which principal concessions are on the coast, some 15 miles west of Vessora, others being more in the interior.

"From the foregoing it will be observed that considerable interest is being centred in these newly-discovered fields, and their ultimate successful development is but a question of time."

Referring once more to the International Petroleum Co., Ltd., unfortunately the work had to be suspended owing to a rebellion of the natives, which now has been subdued by the Portuguese troops. There is no doubt that very successful results would have been achieved in a very short time, but for the interruption. All the indications show that the development of these Oifields will yield the best results.

DREDGING MANILA HARBOUR

The new harbor dredge, recently purchased by the bureau of navigation from the China Navigation Company, Limited, has commenced work on dredging the inner harbor between and about the piers, reports a Manila paper, and continues:—Due to the lack of funds the dredge is only working one shift, but with a suction capacity of 1000 cubic yards an hour, the work should be accomplished in record time.

The inner harbor is to be dredged to a depth of 32 feet low tide, or two feet more than its present depth. This will give a depth of 37 feet at full high tide, a depth that would allow the mammoth freighter *Minnesota*, loaded to her capacity, as she was a few months ago with 20,000 tons of flour, to glide alongside pier two or three as do the many other freighters that make Manila a port of call.

Work at present is being carried on near piers two and three as the churning of vessels' screws has accumulated a great deal of mud near the piers, which is proving a menace to navigation. This will be removed and then the work of dredging the balance of the inner harbor will be accomplished.

After finishing the harbor work at Manila the dredge will proceed to Iloilo to deepen the harbor at that port.

THE JAPANESE IRON MARKET.

Importers of iron and iron materials in Japan are suffering from overstocking and consequent dulness. Already in Spring last symptoms of hard times were in evidence on the iron market, as a result of over-importation. Apparently as a precaution some of the importers in Tokyo and Osaka have refrained from placing fresh orders. Owing, however, to the increased arrival of goods covered by provincial importers not only have the stocks not diminished, but a considerable increase has taken place. Prices have consequently come down heavily while the demand has fallen off. As a rule the season of the greatest demand sets in the early part of October, but this year the usual early Autumn activity has been deferred almost indefinitely.

It is, however, believed by those in the trade that though there is small prospect of an early improvement, signs are not wanting of more or less recovery by next Spring provided the importers refrain from placing fresh orders in the meanwhile and try their utmost to dispose of the accumulated stocks.

ZINC REFINING IN JAPAN

Zinc veins are discovered everywhere in Japan, according to the *Osaka Mainichi*, and are almost inexhaustible. Moreover they are located in convenient places and can be worked with comparative ease. According to experts Japanese zinc ore is of a superior quality and contains 30 to 50 per cent. of pure zinc. Owing, however, to the absence of refining works in Japan it is almost all exported in the state of ore. In return Japan buys from Europe or America refined zinc, sheet or plate zinc and waste zinc to the amount of 4,000,000 *yen* yearly. Last year Kobe alone imported refined zinc to the amount of 5,730,000 *kin*, plate or sheet zinc amounting to 1,340,000 *kin*, and waste zinc to the amount of 2,730,000 *kin*. Several attempts have been made so far to start smelting works, but all have failed owing to the defects of Japanese made crucibles. Now the Mitsui Bishi firms are reported to have appeared on the field. The Mitsui firm has even gone as far as to start the construction of smelting works and a crucible factory at Miike. The Suzuki firm of Kobe has also decided to start smelting works and the building is now under construction at Wakinohama, Kobe.

RAILWAY ENGINEERING IN CHINA

The following address was given by Mr. A. C. Clear of the Shanghai-Nanking Railway at the inaugural meeting of the session of the Shanghai Engineering Society recently:—The chaotic state of China at the present moment, has called forth many pessimistic views of her future, but as from pessimism no progress can result, it becomes us as apostles of progress to banish this attitude of mind and find some ground for and spread a belief in our own optimistic views. It is a difficult task I admit, and therefore all the more congenial to engineers. The present day tendency is all towards speed, and unless our hopes are realized as quickly as we raise them, we are apt to view the delay with despondency. Revolutions in smaller and less conservative countries than China have taken years to settle, and there is no reason that we should expect quicker results here, except perhaps, that we are generally inclined to show more impatience in dealing with things Chinese than in other matters. It may not be uninteresting, although familiar, to most of us, briefly to review the history and developments of railways in China as one is apt to overlook what very recent innovations they are here.

The first attempt to obtain a railway concession was made in 1863, when a number of foreign merchants in Shanghai presented a petition to Li Hung-chang, then Governor of Kiangsu, for the right to construct a railway between Shanghai and Soochow. This was regarded as an attempt by the foreigners to obtain an undue amount of influence in the country and was accordingly refused. Numerous proposals were afterwards made, but no actual railway construction was attempted until 1876, when the Woosung Road was converted into a light railway of 2 feet 6 inches gauge and rails of 26 lb. per yard, the length of line being about nine miles. No authority having been obtained for this conversion, the presence of the railway was strongly resented by the officials, and the first opportunity was taken to get rid of it. This occurred when a Chinese was run over and killed some six months after the opening of the line to Kiangwan, popular feeling being worked upon to such an extent that riots were threatened. To avoid further trouble the line was closed upon instructions from the British Minister. It was reopened some months later, on December 1, 1876, upon the understanding that the Government take over the railway at cost price. The purchase was completed in October, 1877, and the line immediately after closed down, all permanent way material was taken up and, together with the engines and rolling stock shipped to Formosa. Its subsequent fate is well known to all of us.

The next attempt was made by Governor Ling, of Formosa, to obtain a railway there, as other means of communication were practically non-existent. In spite of repeated efforts he failed to move the Imperial Government from their policy of opposition to all that stood for progress, and gave up the attempt. At the conclusion of the Franco-Chinese War in 1885 (during which Taiwanfu, the capital of Formosa, had been bombarded by the French) the Imperial Government gave instructions for the capital to be moved inland to avoid any possible similar attack. The then Governor Liu, evidently impressed with the policy of his predecessor, pointed out the necessity of quick communication from the sea to the proposed inland capital, and finally obtained Imperial sanction to a railway. This line was built under extraordinary difficulties, one of the principal ones being the provision of military labour, the soldiers taking instructions only from their officers, ignoring completely the foreign engineers. Several very costly blunders resulted, and through continually neglecting the advice of the foreign engineers employed, a very unsatisfactory line was built.

The Kaiping coal fields were responsible for the next step in railway development. Originating in a tramway, it was the nucleus of the present northern system of railways. It came about in the following manner. Japanese coal only could be procured for the China Merchants' fleet. It was therefore considered desirable to develop the rich coal deposits of the Kaiping district. Imperial sanction was obtained after the usual difficulties, and the first shaft sunk in 1878. The nearest point to the sea being twenty-nine miles away, a railway was suggested, and after considerable delay, and strong objections on the score of disturbing the Fengshui of the district, sanction was accorded, but, before work was commenced, was withdrawn. Endeavours to sway the Imperial conscience to re-consent being fruitless, it was finally decided to abandon railway transport in favour of a canal. This scheme was, however, not feasible, and eventually sanction was given to construct a tramway, the motive power of which was to be mules.

The work was put in hand with Mr. C. W. Kinder as engineer in charge, and it is due to his persistency and realization of the importance of the subject, that the standard gauge of 4' 8½" was adopted. The result of his insistence on this point has saved China incalculable expense and trouble, as a smaller gauge, if then adopted, would have been insisted upon throughout the country to the general stultification of the carrying capacity of all her railways.

Mr. Kinder was not satisfied with the proposed motive power, and quietly started to build a locomotive from an old portable winding engine. His efforts were discovered and official orders were promptly issued for the construction of the locomotive to be stopped. It was, however, unofficially completed and was in daily use until opposition was withdrawn and proper tank engines were allowed to be procured. This railway was eventually extended to Tientsin.

Beyond this little further in the way of railway development occurred until 1895. Up to this date, barely eighteen years ago, prejudice was so strong against railways that only by the utmost persistence were these small works accomplished. Popular approval and sympathy had not supported these progressive efforts. They were due to the powerful aid of Li Hung-chang (whose attitude towards railways had completely changed) and to that of a few merchants, who by their intercourse with foreigners in the Treaty Ports realized the advantage of progressive measures. It is, however, to this process of inserting the thin edge of the wedge that the realization of the necessity of railways in China is due to-day. All credit is due to the dogged perseverance of the engineers, who, in face of difficulties far greater than any natural ones, stood up against, and overcame the deep rooted prejudice of centuries.

Since the war between China and Japan in 1895, considerable progress in railways had been made; innumerable and familiar obstacles had been overcome, and there was a more general approval and desire for them than had hitherto been the case. China had now approximately 5,900 miles of railway opened, 2,200 miles under construction and some 8,500 projected, irrespective of Dr. Sun Yat-sen's proposals. Progress had been made in other directions. Towns were everywhere installing electric light, telephone systems were becoming a necessity; mills, factories, workshops were springing up in response to the advantages of quick, safe, and cheap transport. In fact the progress made during these last eighteen years, though not startling in amount of actual work done, is remarkable, considering the change wrought amongst the people that have come into contact with these evidences of modern civilization. The gradual utilization of railways must mean more tolerance of our Western methods. The man who once travels in a railway train can never really be the same again; it must have some influence on his opinions. He must in the quiet of his own village compare the speed and comfort of travel by train, to the discomfort and tediousness of boat, wheelbarrow, or other antiquated means. Places that were once beyond his knowledge are now within easy reach, and he is put thus easily into more direct communication with a larger section of the world, and, consequently, his views are broadened.

As an instance of the new appreciation of western methods, it may be mentioned that over 20,000,000 passengers, and 16,000,000 tons of freight were carried on Chinese railways last year—excluding several railways for which statistics were not available. Another striking evidence of the change in public opinion, and one which struck at the very root of all the Chinese held in the deepest respect and reverence, was the yielding to the necessity for the removal, occasionally, of graves, in order that a railway might be properly constructed. An aversion to such removal in the early days gave to some of the lines the most extraordinary alignments. Of this, the Woosung line was a fair example. Even on this vital point the Chinese had lately sacrificed tradition to the needs of progress.

One great bar to progress—the maladministration of public funds—might be partially removed if the Government would give its officials salaries commensurate with their responsibilities and refrain from the periodic taxation of such salaries when in need of funds. It was to the foreign engineer that China must look for aid in railway and all other engineering works for some years to come; and foreign engineers must, by perseverance, square dealing, good and economical work, show that they were not altogether self-seeking but had the country's welfare at heart.

A factor of the first importance in the future development and maintenance of railways in China was the proper training of students, and in this connection a proper course of practical training for the future engineers of China was essential, and should be insisted upon. In no other country in the world are railway problems so intricate and difficult as in China. Her financial difficulties, international complications, Provincial opposition, intrigues of place seekers, etc., combine to render the task of the Minister of Communications anything but easy. The Provinces now generally are accustomed to the idea of railways and evidently require them, if their abortive and expensive attempts at procuring them can be taken as a guide.

The policy of the Government should go far to remove Provincial opposition, and an urgent necessity now was the preparation of standards up to which railways could be built and equipped. A Board of Foreign Engineers established at Peking with a wide scope of powers would remove many of the inconsistencies which now existed, and which in the near future, would involve considerable expenditure to bring up to a standard for the economical and safe working of the railway systems soon to be linked up over the whole country. Up to the present time those railways under the sole control of Chinese, almost without exception, had been allowed to depreciate to such an extent that heavy expenditure must be incurred to put them on a safe and sound footing. The railways of China now represented some $400,000,000 worth of property.

In conclusion, there is need for careful geological survey for ascertaining the position, amount and quality of the mineral wealth of the country, and of guarding against indiscriminate granting of concessions which might ultimately mean great financial loss. Attention should also be given to the provision of a supply of a suitable timber, an important factor in railway construction and maintenance. Plantations might be started on spare land at the sides of the railways, so that timber would then be easily accessible for transport.

AGRICULTURAL PROGRESS IN THE PHILIPPINES.

The Agricultural Bank was organized in the Philippines in July, 1908, and was opened for business in the following October. It had a capital of a million pesos or half million American dollars. This bank established 24 agencies in the provincial capitals, where there were no commercial banks or branches, and of these, twelve were established during the last year.

This Agricultural Bank thus established under the auspices of the American insular government of the Philippines was not established to compete with commercial institutions, but to aid in the development of the country. One of the branches was closed as soon as the regular Filipino bank located a branch there, that is in Zamboanga. As the government is behind the Agricultural Banks, certified checks on the bank are good anywhere in the Philippines, and such use of the checks is rapidly supplanting the transportation of money for the payment of debts. In its report for the agricultural year of 1912-1913 the Bank reported existing loans to the amount of a million and three quarters of pesos, an increase of 800,000 pesos over the previous year. These loans were made in 390 different transactions, 131 of them based on royal grants at 10 per cent. and 259 on Torrens titles at 8 per cent. There have been reported but twenty delinquents, and eight of these were granted extensions. The Bank lost but 100 pesos during this period, and that was on a small loan of 300 pesos properly secured but on outlying property that brought less than the mortgage. The branches are authorized to take time and current deposits, giving 3 per cent. on six months for time deposits, 3½ per cent. on 12 months. No loans are made of any money either on time or current deposit. Time deposits are sent to the head office at Manila and placed with the commercial banks at the rates of interest paid by the Agricultural Bank.

This feature of the agricultural bank's work has only been in operation for three months, and 35,000 pesos have already been deposited on time and 200,000 on current account. The general success of the bank indicated greater possibilities, and an increase in its capital of another million pesos would have been desirable, but the conclusion reached was that the money was so much needed in other directions that the enlargement of the capital would not be made, at least at present. The whole line of procedure in the Philippines, including the educational institutions in the way of experiment farms and stations, suggests the broad general policy of higher agricultural attainment that has produced such wonderful results in the United States during the last few years, and all of which influences are now in full development in that country and a similar development is promised in the Philippines.

COTTON SPINNING IN JAPAN

An enormous amount of spinning and weaving machinery was ordered from Europe and America last year, says the *Asahi*, but the arrival of machinery ordered from England has been delayed on account of the strike at the factory of Mather, Platt & Co. As the result of an agreement among the employers, a uniform rate of wages is paid, while the working hours are fixed by the Factory Act. For this reason, says the *Asahi*, it is impossible for English manufacturers to pay their men extra money and extend their working hours, or to collect the desired number of skilled labourers in any one factory. The strike affected all the other works, and the shipments of all machinery ordered for Japanese buyers has been delayed. The machinery ordered this year has been contracted for arrival by the end of the first half of next year, but in the present state of things in England, the delivery of all the machinery cannot be expected before the end of next year. Industrial business in Japan is depressed owing to the tightness of money, and manufacturers particularly are experiencing great difficulty in finding the necessary funds. If the machinery they have ordered should arrive by the time arranged, they would find it hard to pay for it, and consequently they are rather hoping for further delay. In these peculiar circumstances no trouble has arisen between importers and their clients on account of the delay in the arrival of the goods ordered, though, had such a delay occurred during a period of industrial activity, not a few complaints would have arisen.

ELECTRICAL ENTERPRISES IN JAPAN

Upon making inquiries into the condition of various electric enterprises in Japan, the *Chugai Shogyo Shimpo* remarks that at one time electric undertakings were considered to be very profitable, and capitalists were attracted to such enterprise just as ants swarm to sugar. As a result, electric works of various descriptions on a small scale have cropped up everywhere like mushrooms after a shower of rain. The failure of Mr. Saiga, of Osaka, who was regarded as the "electric king" of the Kwansai district, awakened the business public to a sense of the danger which threatened, and the amalgamation of various small electric companies in Kyushu has been brought about as a result. Enterprises like electrical concerns which tie up a tremendous amount of money, can be successfully conducted only when run on a large scale. The following result of the investigations made by the authorities in regard to the amount of capital invested and the return thereon will give an idea of the prospects of this branch of activity:—

Capital.	Number of Works.	Rates of Dividend.
Y. 50,000 and less	38	0.85
100,000 ,, ,,	32	0.74
500,000 ,, ,,	57	0.83
1,000,000 ,, ,,	17	0.90
5,000,000 ,, ,,	17	0.99
5,000,000 ,, ,,	3	1.03

Japan has claimed an indemnity of $980,000 from China for the incidents at Nanking arising out of the recent rebellion.

PUBLICATIONS

"Gold Dredging" by T. C. Earl (published by Spons, London) is not a highly technical work but a concise summary of the main points of the industry with tables and references and excellent illustrations of operations in many countries. It is a book which should be in the hands of every investor in gold dredging shares and is a valuable addition to the list of mining literature.

Most of the practice described is Australian and New Zealand, as the author is evidently more familiar with conditions in those countries. New Zealand is the pioneer in this branch of mining, while California has perfected the large modern installations which are in keeping with the local conditions found there and in Alaska.

Gold dredging is a most satisfactory and safe form of mining, and when properly undertaken by experienced people it is most always successful.

The weathering and wearing away of the rocks containing gold bearing veins and the carrying down and concentrating of the gold in river valleys and at the mouths of streams is a process of nature which is a most interesting one and where the gold is found so deep and under conditions where it cannot be won by others means, the dredge fulfils its mission and is designed to meet local conditions. Gold dredgers are now scattered over the world in many places and while there have been failures, in the majority of cases profits have resulted. By carefully testing the ground and weighing the conditions prevalent, estimates can be made very closely in advance so that dredging investments are removed beyond the speculative point.

With all the attention that is now being paid to gold and tin dredging it is quite noticeable that no such enterprises are found in China and though there are known areas where dredging for both metals would undoubtedly be profitable, the attitude of China towards any such modern development of her resources hitherto adopted precluded any possibility of anything being done.

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RUSSO-JAPANESE RAILWAY CONNEXION.

The inauguration from January 1 of a combined freight service between the Japanese and Russian railways, remarks the *Osaka Mainichi*, will be followed by the opening of a direct service to Moscow for the transport of two or three certain classes of Japanese goods. Negotiations are now in progress for this purpose. The direct service will be first opened for raw silk and tea. Freight accommodation will be gradually improved after the working of the new service has been tested by actual working, and the list of goods transported direct between Moscow and Japan will be increased. When this arrangement is put into operation, Japanese raw silk and tea sent to Europe will be distributed through Moscow, which is expected to become an important distributing centre. Russian merchants there are already making preparations to meet the anticipated requirements of the circumstances.

THE CHEKIANG RAILWAY.

The shareholders of the Soochow Railway Company (Shanghai-Kashing line) have, in view of the continued bad business of the company, signed an agreement with the Ministry of Communications to sell the line to the Government. On account of the stringency of Government funds, the Ministry promised to pay the amount by instalments. This has met the approval of the shareholders. But a difficulty has now arisen. When Chen Chi-mei was Tutuh of Shanghai, he negotiated a loan from a Japanese firm, giving as security the above line. The loan agreement stipulated that if the loan be repaid before maturity a compensation of $150,000 should be paid to the firm. The Ministry on learning of this has asked the shareholders to settle this question among themselves.

IRON IN KOREA

A Chinnampo paper, quoted by the *Seoul Press*, states that the export of iron ore through that port from mines in Whanghai Province has been very active this year. Up to December 15, 135,263 tons were exported, already showing an increase of more than 3,000 tons as compared with the total amount exported during last year. Of the figures 44,000 tons came from Eunyul, 46,500 tons from Chailyong, 34,183 from Anak and 10,500 tons from Sinchon.

FAR EASTERN RAILWAYS

CHINA

Railways in China.—A Japanese paper reports that the entire length of the Government railways in China is 2,493 miles. The mileage of the different railway lines and the year of completion of the construction work are as given below:

Railway Lines	Mileage	Year of completion
Peking-Mukden....	252	1903
Daokao-Kyonghuai.	96	1904
Peking-Hankow....	814	1901
Tayuan-Shih-kiakai	151	1907
Huchou-Ningpo....	210	1908
Kaifeng-Honan....	140	1908
Peking-Cheng-kai kou...........	124	1909
Tientsin-Pukow....	626	1911
Kirin-Changchu....	80	1912
Total.........	2,493	

Besides the above lines, there are some extending over 2,389 miles owned by foreign companies, and others extending over 351 miles run under the management of the provinces. Thus the total mileage of the railway lines both private and public throughout China is 5,233 miles.

Shanghai-Nanking Railway.—The following figures of traffic returns (approximately) for the week ended November 15 are issued by the Shanghai-Nanking Railway:—

Year.	Passengers.	Goods and Sundries	Total for the week.
	$	$	$
1913....	52,360	12,127	64,487
1912....	43,042	10,108	53,150
Increase.	9,318	2,019	11,337
Decrease	—	—	—

For forty-five weeks.

Year.	Passengers.	Goods and Sundries	Total
	$	$	$
1913....	2,121,060	454,252	2,575,312
1912....	1,975,703	358,459	2,334,162
Increase.	145,357	95,793	241,150
Decrease	—	—	—

Week ended November 22.

Year.	Passengers.	Goods and Sundries.	Total for the week.
	$	$	$
1913....	54,120	14,082	68,202
1912....	43,583	10,706	53,889
Increase	10,537	3,776	14,313
Decrease	—	—	—

For forty-six weeks.

Year.	Passengers.	Goods and Sundries	Total
	$	$	$
1913....	2,175,180	468,334	2,643,514
1912....	2,019,286	368,765	2,388,051
Increase.	155,894	99,569	255,463
Decrease	—	—	—

Week ended November 29.

Year.	Passengers.	Goods and Sundries	Total for the week.
	$	$	$
1913....	47,959	12,363	60,322
1912....	45,125	7,566	52,718
Increase.	2,807	4,797	7,604
Decrease	—	—	—

For forty-seven weeks.

Year.	Passengers.	Goods and Sundries.	Total.
	$	$	$
1913....	2,223,139	480,697	2,703,836
1912....	2,064,438	376,331	2,440,769
Increase.	158,701	104,366	263,067
Decrease	—	—	—

Week ended December 6.

Year.	Passengers.	Goods and Sundries.	Total for the week.
	$	$	$
1913....	50,911	11,666	62,577
1912....	43,153	10,567	53,720
Increase.	7,758	1,099	8,857
Decrease	—	—	—

For forty-eight weeks.

Year.	Passengers.	Goods and Sundries	Total
1913....	2,274,050	492,363	2,766,413
1912....	2,107,591	386,898	2,494,489
Increase.	166,459	105,465	271,924
Decrease	—	—	—

The Hailan Railway.—The work on the Hailan Railway will soon begin in earnest. Director Sze has appointed Messrs. Chang Tah and Wang Chieh-yuan to be Vice-Chiefs of the Eastern and Western Divisions, respectively.

Kiangsu Railway.—At a meeting of the shareholders of the Kiangsu Railway, held at Shanghai, it was decided that the railway should be transferred under State management and that the capital of the shareholders should be repaid by the Government in five years.

The Tientsin-Pukow Line.—Through booking of tickets between the principal stations on the Shantung Railway and the Tientsin-Pukow Railway was commenced from December 15 last.

American Section of Hukuang Line.—It is hoped that the survey of the route to be followed by the American section of the Hankow-Szechuan railway will be concluded before July next. Mr. Randolph, who has been in charge of the edgineering work since the departure of Mr. Beckwith, has made a reconnaissance of a route different from that surveyed for the Szechuan Railway Company. The Chinese line was about 100 miles in length, as against 60 to 65 proposed by Mr. Randolph. From Nau-to-chi to Kweichow in Hupeh, the distance is about 40 miles, and the line should be properly surveyed by January. There will probably be about 12,000 feet to 15,000 feet of tunnels with numerous small bridges, but the section will not be so difficult as that lying between Ichang and Nau-to-chi. In this section there will be about 22,000 feet of tunnels and about 300 feet of bridges.

JAPAN

Nagareyama Railway Co.—All the shares in this company have been taken up. The company proposes to build a light railway, 5.50 miles in length, connecting Umahashi station on the coast line of the Government railways and the Tone Canal *via* Kogane, and Nagareyama, important industrial towns in Chiba prefecture, with a capital of 100,000 *yen*. It is expected the whole line will be completed by April next year.

Tokyo Central Station.—The Central Station, now nearing its completion, will be the largest, as well as the most magnificent, in the Orient. The work was begun about six years ago, and the Station will be finished and ready for actual service in July 1914. The estimated cost of the whole building is 2,500,000 *yen*. In its elaborate architectual plan and modern equipment for the comfort, safety and convenience of passengers, the Station challenges any other building of similar size in the world to-day.

The whole building is of steel frame and reinforced concrete, brick facing, fire proof, and three stories high. The Station proper is 184 *ken* in length and from 11 *ken* to 22 *ken* in width, and covers an area of 2,341 *tsubo*.

The ground floor is entirely used for passenger traffic; there are ticket offices, waiting rooms for 1st, 2nd and 3rd class passengers, a special waiting room for women, a dining hall, and baggage rooms. In the adjoining building in the rear, toilet rooms, lavatories, a public telephone booth, telegraph office and news stand will be provided; one broad passage is made exclusively for out-going passengers.

The special entrance is provided for the use of the Imperial household. The sitting room, waiting room, reception room and auxiliary rooms will be decorated with the finest work of art; at present, brilliant marble walls are receiving the finishing touch. Wagons and other vehicles with baggage can reach the train directly through a part of the building. The basement is divided into two sections; one used for the boiler rooms from where steamheat will warm the entire building in winter; the other is for kitchens. Except three large dining rooms and several adjoining rooms at the south wing on the 2nd floor, the rest of the 2nd and 3rd floors will be used for railway business offices.

The building is furnished with electric light; has three elevators and 11 hydrants around the building. The spacious ground facing the front of Station will be turned into beautiful squares.

Railway Extension Funds.—With reference to the Railway Budget estimates for the coming fiscal year, Mr. Morimoto, Chief of the Accounts Bureau in the Imperial Railway Board, states that the total railway Budget estimates aggregate somewhere near 122,000,000 *yen*. Of this 61,400,000 *yen* is for business expenditure, 1,000,000 *yen* for subsidies to the light railway construction, 500,000 *yen* for special reserve, and 4,000,000 for payment of advances from the Deposits Bureau. It is true that the Railway Board has repeatedly conferred with the Finance Department authorities with a view to obtaining advances, but nothing definite is yet decided. Accordingly the amount of the advance is still unsettled, although it appears that an agreement will be concluded for a loan of some 37,500,000 *yen*. The authorities are rather doubtful as to the advisability of laying a railway extension scheme spread over a period of seven years as advocated in some sections by the public. The Railway Board, however, is desirous to obtain at least 42,000,000 *yen* required for railway extension and improvement.

New Light Railways.—The Railway Board has given a charter to the Shimotsui Light Railway Company for the construction of a line, 4 miles in length, connecting Chaya with Kurashiki, Tsukubogun, Okayama prefecture.

A charter has also been granted to the Moji Chikko Railway Company promoted by Mr. Kawano Naotaro and others for the construction of a steam light railway, 11 miles and 20 chains in length connecting Tanoura, Moji, with Sone village, Kikugun, Fukuoka prefecture, with a capital of 630,000 *yen*.

A charter has been given to the Kominato Railway Company for the construction of a light railway, 31 miles and 50 chains in length connecting Goi, Ichihara-gun, with Mina village, Awa-gun, Chiba prefecture.

The Kibitsu Light Railway Company has also obtained a charter for laying a light railway, 2 miles and 40 chains in length, between Magane village and Niwase in Kibigun, Okayama prefecture.

The Makio Railway Company promoted by Mr. Nagao Uhachi and several others with a capital of 500,000 *yen* has obtained a charter for the construction of a light railway, 11 miles and 48 chains in length, connecting Hamadera and Yokoyama village in Synhoku-gun, Osakafu.

MANCHURIA

South Manchuria Railway.—The traffic earnings for the month of November amounted to Y2,199,093, being an increase by Y280,973 over the corresponding month of last year. The aggregate earnings for the eight months since last April reached Y13,278,700, being an increase by Y3,065,200 on the corresponding period of last year. During November the freight receipts of the Railway alone amounted to Y1,633,953

The *Manchuria Daily News* is informed that the S. M. R. Co.'s estimates for the next fiscal year include about Y13,400,000 for capital expenditure, about Y42,000,000 for receipts, and about Y37,000,000 for expenditure, leaving for the net profit the balance of about Y5,000,000. Compared with the estimates for the current fiscal year, a decrease of about Y700,000 is observed in the capital expenditure and an increase of about Y4,000,000 in each of the receipts and expenditure. Details of the estimates are given elsewhere.

The same paper says:—Opinions vary on the question of raising the rate of dividend of the S. M. R. Co. by 1 or 2 per cent. per annum. Those who are against raising the rate say that the Company's net profit is only Y5,000,000 per annum at present. The old shares of Y20,000,000, of which Y16,000,000 has already been called up, added to the new shares of Y40,000,000 recently subscribed to, of which only the first instalment of 10 per cent. has been called, make the private capital invested in the Company Y60,000,000, apart from the Government shares of Y100,000,000, which is the appraised value of the old narrow gauge railways, buildings, the Railway Area, etc., as handed over to the Company on March 31st, 1907. When all the aggregate capital of Y160,000,000 is to receive the dividend at the present rate, the total amount required therefor will reach Y9,600,000, which is nearly double the present net profit.

Supingkai-Taonanfu Railway.—The report that the construction of the Supingkai-Taonanfu Railway will probably be commenced on the return of spring has spread along the country through which the railway in project is supposed to pass. The more enterprising Chinese are buying lands which they think will be selected as the sites of railway stations. In consequence, the price of lands along the proposed railway route has risen, and with it the house-rents have also been raised. The surveys for the line are to be completed during this winter, and the construction work will be started on the return of spring. Mr. Sun Pao-chen, ex-Director of the defunct Board of Foreign Intercourse, is mentioned as candidate for the Directorship of the new Railway.

Kirin-Changchun Railway.—A new station was opened at Kutien between Huapichang and Chiuchan on the Kirin-Changchun Railway on December 10. The country about the new station is a fertile bean zone, and the producers there felt great inconvenience because of the lack of railway facility, both Huapichang and Chiuchan being situate a good distance away.

Penchihu-Niuhsintai Light Line.—The project of laying a light-rail line between Penchihu and Niuhsintai passed the Provincial Assembly and the franchise was granted to Chairman Chin of the Penchihu Prefectural Assembly. Work was commenced about two months and a half ago. The promoters had some difficulties with inhabitants regarding the purchase of lands for right of way, but these difficulties were soon amicably terminated. The line is expected to be completed about January 20.

The line starts on the left bank of the River Taitzu near the Railway Bridge at the east of Penchihu, and is fourteen miles long. The estimated cost is about Y180,000. The promoters have in plan the ultimate extension of the line to Chienchang, but this scheme is encumbered with sundry obstacles, and its accomplishment is accepted as a difficult task. At all events the completion of this line will quicken the operation of the colliery at Niuhsintai and at the same time boom Penchihu.

MALAYA

Penang Hill Railway—The Railway commences at a point about 800 yards from the junction of Ayer Etam and Government Hill Roads and ends on the South side of the spur on which "Strawberry" bungalow now stands. The two end stations are at levels of 115 feet and 2,387 feet, respectively, above mean sea level, giving a total lift of 2,272 feet in a distance of 1 mile 433 yards and a mean gradient of 1 in 2·7

It will be constructed in two independent sections, and all traffic will be transferred at an intermediate station, at an elevation of about 1,150 feet. The division into two sections has been necessary owing to the peculiar configuration of the hill, and the desire of obtaining a line economical to work combined with moderate capital cost.

Two carriages will be used on each section attached to either end of a steel wire cable. They will leave and arrive at the stations simultaneously and pass each other at the middle of the section. Each carriage will hold about forty passengers, and when working to its full capacity the line will be capable of dealing with over 3,000 passengers daily. Provision will be made for the conveyance of heavy building materials. The winding machinery will be driven by electricity supplied from the Municipal Electrical Power Station.

The line should be open for traffic towards the end of 1915.

THE PHILIPPINES

Manila E. R. and L. Co.—The Manila Electric Railroad and Light Co. are increasing the capacity of their Manila station by the addition of a 2,500 K.W. Allis-Chalmbes turbo-generator, bringing up the total output of the plant to 9,250 K.W. 2-phase at a pressure of 3,600 volts. The additional steam power required is being met by the erection of a further battery of two Babcock and Wilcox water tube steam boilers each of 400 H.P. (@ 34½ lbs. evaporation) at a pressure of 180/200 lbs. to the square inch, superheated by 100/120 deg. Fahr. The condensing plant for the set is of the Alberger Surface condensing type of 7,000 sq. feet cooling surface, with steam driven air and circulating pumps. A turbine driven hotwell pump is also being installed.

A Westinghouse motor generator set for the railway power is also being added. This set is of 1,000 K.W., the motor end being connected to a synchronous generator of 600 volts d.c.

The work of erecting these additions under the direction of B. H. Blaisdell, chief engineer, is now proceeding and it was hoped to have the motor generator set running when the increased demand for power was made during the Christmas holidays and the turbo set in time for the Manila Carnival and Philippine Exhibition, which will both be held in early February.

Manila Railroad Company.—The *Manila Daily Bulletin* reports that this company is determined to proceed with the line ending at Baguio, in spite of the assertion that the Aringay-Baguio extension was to be abandoned. Our contemporary proceeds:—Already eighty per cent. of the grading from Aringay to Baguio has been accomplished. Nine kilometers of railroad are laid out of Aringay and the construction will continue. The completion of the line to Baguio, it is estimated, will be in 1915.

Although the abandonment of Baguio as a government summer capital will be a temporary setback, the officials believe that with an increasing knowledge of the mountain city nothing can permanently prevent its growth.

GENERAL

Western Amur Railway.—The *Dalakaya Okraina* report:—Traffic has been opened on a part of the Western Amur Railway, and regular goods and passenger trains have been running between the station, Kuenga of the Transbaikal Railway and Kerak of the Western Amur Railway, which is a distance of 779 versts, since the 15th/28th October. The railway will be extended to Blagovyechtchensk, which means an additional 580 versts, so that the distance will be in all 1,359 versts. In January it is expected to run trains between Tchita and Blagovyechtchensk in three days.

TRAMWAYS

Shanghai Tramways.—The following is the traffic return of the Shanghai Tramways (Foreign Settlement) for the month of November, 1913, and for eleven months ended November 30, 1913, with figures for corresponding periods last year:—

	Nov. 1913. $	Nov. 1912. $
Effective receipts . . .	79,266.42	68,893.58
Passengers carried . .	4,147,254	3,512.793
Car miles run	246,413	226,387
Loss by depreciation of subsidiary coinage . .	21,663.88	19,330.82
Percentage of loss by depreciation of subsidiary coinage	22.66	23.29

	11 months ended Nov. 30, 1913 $	11 months ended Nov. 30, 1912. $
Effective receipts . . .	842,339.66	730,929.98
Passengers carried . .	43,566,754	37,385,171
Car miles run	2,632,640	2,521,922
Loss by depreciation of subsidiary coinage	236,414.57	221,271.43
Percentage of loss by depreciation of subsidiary coinage	23.14	24.72

Week ended November 19, 1913.

	1913. $	1912. $
Effective receipts (after deducting loss by depreciation of subsidiary coinage)	18,888.77	16,174.51
Passengers carried. . . .	983,811	823,813
Car miles run	57,425	53,544

The loss by depreciation of subsidiary coinage for the week was $5,089.20, equal to 22.38 per cent. of the gross cash collected on the cars as compared with $4,537.11, equal to 23.29 per cent. for the corresponding week last year.

Week ended November 26.

	1913. $	1912. $
Effective receipts (after deducting loss by depreciation of subsidiary coinage)	18,188.30	16,070.65
Passengers carried. . .	950,600	817,549
Car miles run	57,701	53,565

The loss by depreciation of subsidiary coinage for the week was $4,972.39, equal to 22.69 per cent. of the gross cash collected on the cars as compared with $4,440.24, equal to 23.04 per cent. for the corresponding week last year.

Week ended December 3.

	1913. $	1912. $
Effective receipts (after deducting loss by depreciation of subsidiary coinage)	17,523.66	15,814.64
Passengers carried. . .	921,408	803,197
Car miles run	56,050	52,904

The loss by depreciation of subsidiary coinage for the week was $4,936.04, equal to 23.23 per cent. of the gross cash collected on the cars as compared with $4,375.31, equal to 23.04 per cent. for the corresponding week last year.

Week ended December 10.

	1913.	1912.
	$	$
Effective receipts (after deducting loss by depreciation of subsidiary coinage)	18,335.48	15,900.69
Passengers carried . . .	963,545	805,846
Car miles run	57,054	52,635

The loss by depreciation of subsidiary coinage for the week was $5,208.73, equal to 23.32 per cent. of the gross cash collected on the cars as compared with $4,353.71, equal to 22.82 per cent. for the corresponding week last year.

OIL

Alleged Concession in Shensi.—It has been reported in some of the Chinese papers that certain petroleum concessions in Shensi have been or are to be made to the Sino-Corporation.

CEMENT

Hupeh Cement Works.—According to the Chinese Press these works are still in the hands of the Japanese mortgagees. Two of the three foreign employees are reported to have left. It is reported that the company has been negotiating with German firms in the hope of raising a loan to pay off the debt to the Japanese and to recommence operations at the Works, but it has been found impossible hitherto to arrive at terms.

However, according to a statement obtained at the Hankow office of the Hupeh Cement Works, the company still has hopes of saving the works from falling into the hands of the Japanese mortgagees. The *Central China Post* is informed that the bankers from Kirin, have actually landed Tls. 300,000 in Hankow to redeem a part of the debt on the Works. However, the money has not yet been handed to the cement company. The Kirin financiers insist on having a clear statement of the finances of the company before advancing the cash, but the company has the curious idea that it should get the cash before giving the statement.

There the matter stands at present, and the Works meanwhile remain closed.

PUBLIC WORKS

Hongkong Public Works.—The programme of Public Works Extraordinary reaches the unprecedented total of $2,130,800, said the acting Governor of Hongkong in his Budget Speech on Oct. 9. The nearest approximation to this amount was in 1905, when a sum of $1,815,300 was provided in the Estimates for Public Works Extraordinary. Then, as now, there were several large works in progress which absorbed substantial sums. I may point out that the sums provided for the Tytam Tuk Waterworks Scheme and the Typhoon Refuge alone are $1,040,000, or practically half the total amount, whilst the Wireless Station absorbs another $100,000.

Reclamation Work at Hsiaokangtzu.—The application of the S. M. R. Co., to have the commencement of the reclamation work along the shore front of Hsiaokangtzu postponed till the end of 1915 has been sanctioned by the Kwantung Government. The Company's plan is to lay out about Y1,000,000 over three consecutive years.

SHIPBUILDING

Despatch Boat for Philippines.—The Chief Quartermaster of the Philippine Government is advertising for the building of a steamer for use as an express passenger and despatch boat. April 10, 1914, is the limit for receiving proposals, which must carry a guarantee of Pesos 20,000. A twin steamer is proposed to do from 16 to 22 knots an hour.

Encouragement of Ship Building.—The *Asahi* quotes the authorities of the Japanese Communications Department as follows on the effect of the encouragement of shipbuilding in Japan :—Before the adoption of the Shipbuilding Encouragement Law in October 1896, the shipbuilding industry in Japan was in a very primitive state, as may be seen from the fact that in 1883 one wooden steamer of 1,416 tons was built, in 1891, one steel steamer of 700 tons, and in 1895 one steel steamer of 1,502 tons; all the steamers which were then required being imported from abroad. Since the adoption of the Law the industry has made rapid progress, and up to the end of last year about 110 steamers, with an aggregate tonnage of 334,345 tons, had been built with the subsidy granted under that Law; the total amount of subsidies granted being Y7,527,923. In Europe and America privileges and protection in various forms are still being given to the industry, and it is therefore necessary in insular Japan to extend increased protection and encouragement to the industry.

A Slump Foreshadowed.—The *Mainichi* reports that with the usual slackening of trade in the summer the demand for freights has declined. This has in turn affected negotiations for the purchase of steamers. Of seven steamers, which have been purchased by Japanese, but have not yet been delivered, it is probable that the orders for three or four will be cancelled and the bargain-money forfeited. Coal freights from Moji to Yokohama, the standard rate of the coasting trade, have declined to 70 sen per ton, and shippers are wanting even at that rate. It is feared that the marine transport business will experience a bad slump in the autumn.

Shanghai Dock and Engineering Co—The American transport str. Liscum, which sank about twelve months ago in the dock of the Shanghai Dock and Engineering Company is again afloat. With great difficulty and much skill she was refloated, internal fittings were replaced, and on October 8 she proceeded for a trial trip. Shortly after noon the vessel left the Old Dock with the officers and their friends. In every respect the trial was satisfactory, and the trip also served to fix up the compasses. The ship went as far as the Light Ship, some considerable distance beyond Woosung and returned towards seven o'clock. The working of the engines and of all details of the transport are described as excellent. The vessel is thirty years old, and this is the second occasion that she has been in the hands of the Dock Co. She was rebuilt in 1903 when the whole of the wood work, decks, and fitting were replaced. The success of the trial trip should more than assure her of many years service to the American Government.

FINANCIAL

Banque Belge Pour L'Etranger.—The report to June last shows the net profit balance amounts to Frs. 1,483,270, and permits the repetition of the dividend of 5 per cent., or Frs. 25 per share, and the allocation of Frs. 500,000 to the special reserve.

The general meeting was held on November 19. The balance-sheet was approved, and the dividend will be payable from December 1. In the report it is stated: "The branches give full satisfaction. China has suffered the inevitable effects of the sudden change of *régime*, but the high qualities of the new President have given him the necessary authority to lead the new China in the way of progress. The bank has participated in several financial operations made by the Chinese Government, chiefly that of the Re-organization Loan. Further, some important industrial transactions have recently been made in Belgium, which will attract an influential *clientèle*. The commercial position is healthy and money plentiful. Despite the crisis, our Tientsin branch has made good progress, and that of Cairo has also given encouraging results."

It may be remembered that the extraordinary general meeting held March 13 last, when the name of the bank was altered from Bank Sino-Belge, it was decided to increase the capital from Frs. 15,000,000 to Frs. 50,000,000. This increase was partially accomplished in June last by the issue of 30,000 shares of Frs. 500, which brought the issued capital up to Frs. 30,000,000. One advance that has been made is to acquire, on favourable terms, the Anglo-Foreign Banking Company, Limited, established in London since 1872.

Tokyo Short Term Loan.—The Tokyo Aldermanic Assembly recently gave approval to the contract for a loan of 3,720,000 yen between Mayor Baron Sakatani and Mr. Shidate, representative of a syndicate of five banks, the Industrial Bank of Japan, 1st, 25th, Mitsui and Mitsu Bishi. The loan is to be used in paying interest on the Municipality's existing debt, and of the total amount, 1,310,000 yen was to be paid in at once, 310,000 yen on the 2nd of Dec., 100,000 yen on the 20th of January 1914, 600,000 yen on the 8th of February, 600,000 yen on the 23rd of the same month, 240,000 yen on the 20th of March, and the balance, 580,000 yen, later. The rate of interest is to be fixed at that prevalent in the days fixed for payments of the instalments, that for the first instalment being 2 sen 2 rin daily per 100 yen. Each instalment is to be paid over in the form of three months promissory notes. The loan is to be redeemed through the issue of a municipal loan some time in the first half of 1914.

Alleged Szechuan Loan.—A telegram from Chengtu states that the loan negotiations between the Governor of Szechuan and a French bank have been brought to an amicable termination, and instructions from the Peking Government are now awaited.

The loan amounts from ten to twenty million taels and is at Taels 92 net with 5 per cent. interest, redeemable in the course of 20 years, being secured with the oil and cubic measure taxes.

The loan is to be appropriated for the redemption of war notes.

Hupeh Cement Works.—It is reported that the Premier, Hsiung Hsi-ling, has sanctioned an agreement concluded between the Hupeh Cement Works company and the Tientsin-Paochang Bank (a Chino-French commercial bank with offices in Peking and Tientsin) for a loan of Tls. 1,400,000 at 8 per cent. interest for a period of twenty years.

The net yield of the loan is to be 91 per cent. The lender is to get 3 per cent. commission on all sales to the company's cement. Interest is to be paid half-yearly.

The sum of Tls. 1,001,000 net is to be paid immediately by the lending bank for the repayment of the company's Japanese and Chinese creditors, while the remainder will be reserved for working expenses. All the company's buildings, godowns and other properties are pledged as security. If the loan cannot be repaid within twenty years as stipulated, an extension of five years is to be allowed.

The amount of loan money remaining for the resumption of operations at the Works will be Tls. 273,000.

Foreign Loan for Kawasaki Dockyard.—The *Japan Chronicle* learns that the Kawasaki Dockyard Company, Kobe, has successfully negotiated a loan of Y1,000,000 from the London and Midland Bank for the redemption of the outstanding loan. The money was received on December 3. The term of the loan is said to be one year on a note, which is renewable every four months. The interest receivable by the foreign banks which have advanced money is said to be 5 per cent, but as the Specie Bank, which served as intermediary, and the Naniwa Bank, which guarantees repayment, are to receive a fee of 2 per cent., the total rate of interest will be 7 per cent., which is charged for the first four months. Thereafter interest will be charged at the current bank-rate.

The Dockyard is also in receipt of Y1,360,000 that was owing by the Chinese Government, namely, Y360,000, the balance due on a gunboat built at a cost of Y750,000, and Y1,000,000 for other munitions of war. These notes are payable on December 30th and January 30th next.

Kobe Water-Works Loan.—In accordance with previous arrangements the Kobe Municipal Assembly held a meeting recently to discuss the proposed issue of waterworks debentures. Forty members were present. For some reason, the question was discussed *in camera*. At 12.30, the hall was opened to the public and a resolution was adopted to the effect that the amount of Y1,700,000 should be raised at the interest rate of 6 per cent. per annum, the issue price being Y95. No repayment shall be made in the first three years, and the whole amount is to be paid off in the following thirteen years. The meeting was closed at 1 o'clock in the afternoon.

In this connection it is said, reports the *Asahi*, that although the issue price is 95, the net amount to be received by the City Office will be only Y90,50 per Y100. The Mitsui Bank which has taken up the issue, will keep Y700,000, offering the balance for public subscription.

Toyo Kisen Kaisha Debentures.—On October 10th the Toyo Kisen Kaisha placed two million yen worth of 8 per cent. debentures on the market, and at noon the following day they had been oversubscribed by 700,000 yen. In this connection the *Chugai Shogyo* says that considering the smallness of the amount to be raised and the comparatively high interest offered at any other time it would not be surprising to find the debentures meeting with a good reception, but at the present moment, when money is tightening and negotiable papers are completely out of demand, it is surely phenomenal that they should have commanded such a ready market. In some quarters it is regarded as foreshadowing some change in the money market. As a matter of fact the banks and investors are suffering from overflowing purses as a consequence of the heavy decrease in the demand for money due to the general depression, and are at a loss as to where they can invest their funds with comparative safety. Therefore the issue of the debentures met with a ready response.

COMPANIES

Kishimoto Steamship Co.—The net profit of the Kishimoto Steamship Company, of Osaka, for the last half year just closed, amounted to Y20,884, which brings up the total to Y22,483, including a surplus brought over. This sum has been disposed of as follows:—

Reserve...	Y1,500
Bonuses to the officials	1,900
Dividend, 10% per annum	10,000
Carried forward	9,594

Hoden (Japan) Petroleum Company.—The net profit of the company for the half year is put down at Y1,414,591, and the proposed rate of dividend is 18 per cent. per annum.

Goto (Japan) Woollen Factory Co.—At the general meeting of this Company the following proposal for the disposal of the term's profits was passed:—

	Yen.
Net profits for the term	118,904,381
Brought over from last account	10,763,216
Total	129,667,597

This amount was disposed of in the following manner:—

Legal reserve...	6,000.000
Depreciation reserve	10,000.000
Sinking fund for fixed capital...	5,000.000
Bonuses for directors and auditors.	5,000.000
Compensation disbursements ...	1,100.000
Dividends at 10 per cent	82,500.000
Carried forward to next account..	20,079.000

Japan Tannery Co.—At the general meeting of this company the following proposal for the distribution of the profits was passed:—

	Yen.
Net profits for the term	170,024.472
Brought over from last account	66,061.043
Total	245,085.515

This latter amount was disposed of in the following manner:—

Legal reserve	10,000.000
Sinking fund for fixed capital	15,000.000
Secondary reserve	15,000.000
Bonuses for directors and auditors and social expenses... ...	12,500.000
Dividends at 10 per cent.... ...	125,000.000
Carried forward to next account	67,585.515

Meiji Tannery Co.—This Company held its general meeting recently when the following proposal for the distribution of profits was passed:—

	Yen.
Gross earnings	40,930.110
Gross expenditure	24,017.919
Balance	16,912.191
Depreciation in the Company's assets	1,000.000
Balance	15,912.191
Brought over from last account	1,982.237
Total	17,894.428

This latter amount was distributed in the following manner:—

Legal reserve...	900.000
Bonuses for directors and auditors	900.000
Dividend at 7 per cent...	14,000.000
Carried forward to next account	2,194.428

Shimabara Gas Co.—The Shimabara Gas Company, promoted by businese men of that city, has completed the placing of its shares and will shortly begin the work of constructing the gas works. The capital stock of the company is 100,000 *yen*, divided into 2,000 shares, of which 900 were taken up by the promoters and the balance subscribed by the public. The Company is being aided by advice from the Kyushu Gas Company.

It was originally planned to remove the Kosone Gas plant of the Kyushu Gas Company to Shimabara, but owing to the increased demand for gas in the city of Nagasaki, especially from the Mitsu Bishi Company's Dockyard and Engine Works, it has been found impracticable to remove the Kosone plant to Shimabara, and the Shimabara Gas Company will buy a completely new plant The expense of establishing the central plant is estimated at 70,000 *yen*

Meiji Sugar Co.—At the general meeting of the Meiji Sugar Manufacturing Company the profits for the term, which, with the sum brought over from last account and that transferred from the dividend equalisation fund, amounted to 627,358,814 *yen* were distributed in the following manner:—

	yen.
Legal reserve	30,000.00
Fees for directors and auditors	30,000.00
Dividend at 12 per cent.	419,250.00
Carried forward to next account	76,108.81

Shinagawa White Brick Co.—At the semi-annual general meeting of this Company the following proposal for the distribution of profits was passed:—

	yen.
Gross earnings for the term ...	440,963.41
Gross disbursements for the term	355,511.43
Depreciation in the company's property.	13,000.00
Balance (net profits for the term	72,451.98
Brought over from last account...	4,087.32
Total	76,53931

This amount was disposed of in the following manner:—

Legal reserve	5,000.00
Bonuses for directors and auditors	5,000.00
Dividend at 10 per cent. per annum	56,250.00
Carried forward to next account..	10,289.31

Hongkong and South China Steam Fisheries Co., Ltd.—The following report and statement of accounts have been issued to shareholders in this Company for the financial year ending 30th June, 1913:—

In pursuance of the special resolution passed at the extraordinary general meeting held on 29th October, 1912, the *Hoi Fung* was despatched early in November from Shanghai to Nagasaki, where a subsidiary Company known as the Nisshin Giogyo Kabushiki Kaisha was formed with a nominal capital of Yen 150,000 of which Yen 105,000 was paid up.

After undergoing a complete overhaul, and successfully passing the necessary Japanese Government surveys, the *Hoi Fung* was transferred to the Japanese flag and renamed the *Kaiho Maru*.

The preliminary expenses in connection with the transfer and the formation of the Japanese Company including duty, Government fees, legal and incidental expenses, etc., amounted approximately to Yen 11,000 This, for the most part, has been debited to capital account of the Japanese Company, but about Yen 2,000 had been charged to their working account and again a part has been borne by the Company.

In order to provide for this additional outlay and to reduce the already heavy overdraft with the General Managers, it was deemed advisable to call up the balance of the capital of this Company.

A final call of $3 per share was accordingly made in April last, and was well responded to, although 795 shares (mostly Chinese whose present addresses cannot be traced) are still unpaid and liable to be forfeited.

The working account of the Japanese Company covers a period of only about four and a half months' actual working, and, although charged with a good deal of extraordinary expenditure which will not occur again, shows a small profit of some Yen 1,939.22, which is carried forward to the current half-year.

The trawler account now disappears entirely from the balance sheet and the asset is replaced by scrip in the Nisshin Giogyo Kabushiki Kaisha to the face value of Yen 105,000.

A book profit of $7,891.31 was made on the sale of the trawler to the Japanese Company, but, in spite of the fact that the earning capacity of the trawler has been increased the General Managers and Consulting Committee deemed it prudent to write down the value of the Japanese shares to $90,000, thereby increasing the debit at profit and loss account to $59,566.98.

The General Managers' Commission and Consulting Committee's fees are again waived.

Ewo Cotton Spinning and Weaving Co., Ltd.—The consulting committee of this company decided that the shareholders should be recommended to apportion the balance at credit of profit and loss account on October 31, 1913, of Tls. 564,753.22, as follows—

To pay a dividend on the preference shares at the rate of 7 per cent. per annum, absorbing Tls. 28,000.00; pay a dividend of Tls. 15 per share on 15,000 ordinary shares, absorbing Tls. 225,000.000; write off plant and machinery Tls. 60,000.00; write off buildings Tls. 12,000.-

00; write off furniture Tls. 500.00; pay a bonus to staff at mills Tls. 5,000.00; place to equalization of dividend Tls. 100,000.00; place to reserve fund Tls. 125,000.00 and carry forward to new account Tls. 9,252.22.

Japan-China S. S. Co.—The semi-annual general meeting of the Japan-China S. S. Company was held recently and the terms profits were disposed of in the following manner:—

	Yen.
Brought over from last account.	299,208.56
Net profits	494,259.14
	793,468.13
Legal reserve..	24,712.98
Dividend Equalization fund ..	300,000.00
Dividend at 9 per cent..	364,500.00
Bonuses for officials	24,712.98
Carried forward to next account	79,542.17

Nippon Yusen Kaisha.—The accounts for the half year are as follow:—

	Yen.
Brought over from last account ..	881,891.06
Net profits for the term	2,884,898.80
Total	3,766,789.36

The latter amount is to be disposed of in the following manner:—

Reserve fund	144,244.94
Fund for the extension of the company's operations and the improvement of the company's fleet . ..	700,000.00
Construction funds	500,000.00
Special reserve fund	300,000.00
Fees for directors and auditors ..	73,555.00
Dividend at 10 per cent.	1,100,000.00
Carried forward to next account ..	948,989.92

Chinese Engineering and Mining Co.. Ltd.—The annual general meeting of the shareholders of the Chinese Engineering and Mining Company, Ld., was held in London on December 5, when the directors' report and statement of accounts for the year ended June 30, 1913, were to be submitted. The following are extracts from the directors' report:—

The net result of the year's transactions shows a balance to the credit of profit and loss account of £85,854 made up as follows:—

		£
Proportion of Kailan Mining Administration's profit, less sundry expenses ..		99.977
Interest		4,648
Agency fees		4,000
Sundry receipts		1,110
	Total	£109,735

DEDUCT.

Expenses in Europe	7,002	
Directors' fees	3,843	
Income-tax..	7,079	
Preliminary expenses	5,957	23,881
leaving a net balance of		£85,854

which the directors recommended should be appropriated as follows:—

	£	
Interim dividend 3½ per cent. paid May 15, 1913, absorbed	35,000	
Final dividend 4½ per cent. (making 8 per cent. for the year)	45,000	
		£
Balance carried forward	5,854	85,854

Yokohama Electric Co.—The profit and loss account for the last term was as follows:—

	Yen
Net profits for the term	416,254,80
Brought over from last account ..	10,569.37
Total.	435,824.17
To be distributed:—	
Legal reserve	21,000.00
Sinking fund for fixed capital.. ..	40,000.00
Dividend reserve	30,000.00
Bonuses	33,300.00
Dividend at 11 per cent	290,880.00
Carried forward to next account ..	20,644.16

Tokyo Stock Exchange.—The profit and loss account showed that the net profits for the term, plus amount brought over from last account, was Y. 449,712.39. This amount was to be disposed of as follows:—

	Yen
Legal reserve..	22,460.00
Sinking fund for construction expenses	4,000.00
Dividend at 10.4 per cent	416,000.00
Carried forward to next account ..	7,252.39

Fuji Gassed Spinning Co.—The profit and loss account for the last term was as follows:—

	Yen
Gross earnings for the term	1,292,617.75
Sinking fund for fixed capital ..	132,045.00
Consolation allowance for Mr. Hibiya, ex-president of the company	100,000.00
Balance (net profits for the term).	1,060,572.75
Brought over from last account ..	883,123.86
Total	1,943,696.62

This latter amount is to be disposed of in the following manner:—

Legal reserve	53,028.00
Loss reserve	53,028.00
Bonuses for operatives, and fund for the amelioration of the condition of operatives	53,028.00
Bonuses for employees, pension reserve, and fees for directors and auditors	53,030.00
Dividend at 12 per cent	720,000.00
Carried forward to next account..	958,556.62

International Cotton Manufacturing Co., Ltd.—The report for the year ended September 30, 1913, stated that the balance at credit of profit and loss account amounted to Tls. 262,167.70, which the Directors recommended be apportioned as follows:—

	Tls.	Tls.
To write off for Depreciation:		
Spinning Dept.—		
Buildings	3,519.84	
Plant and Machinery ...	31,066.13	
		34,585.97
Weaving Dept,—		
Buildings	1,098.41	
Plant and Machinery ...	5,365.40	
		6,463.81
Village Account—		
Buildings	2.063.15	
Furniture Account	1,887.07	
		3,950.22
To pay a Dividend of 10 per cent. plus a Bonus of Tls. 2½ or Tls. 10 per share on 8,384 Ordinary Shares	83,840.00	
7 per cent. on Preference Shares	4,733.98	
		88,573.98
To place to Reserve		25,000.00
To place to Equalisation of Dividend Fund ...		75,000.00
Carry to New Account		28,593.72
		Tls. 262,167.70

LIGHT AND POWER

Electric Plant for Szechuan.—It is reported that the Siemens China Electric Engineering Company has obtained a contract to instal an electric power plant at the salt-mining town of Tseliutsing, over a hundred miles west of Chungking. This will probably be the farthest point in inland China to which electric power will have penetrated.

The plant is to be run by steam, and it is said that the coal from the surrounding district is eminently suitable for power production. Five-thousand volt machinery is to be installed.

The electricity will be used for winning the salt from the wells, which have a depth of 2,000 feet. At present the salt is raised in buckets and is carried from the wells by mules. With the electric power it is estimated that it will be possible to take as much salt away in an hour as is now taken in a day. The scheme is being financed by the Tung Ming salt company of Tseliutsing.

Changchun Electricity Works.—The *Manchuria Daily News* reports that these works have had a run of thriving business. The lighting service reached 10,000 lamps at the end of last September. The foundation work was started in the summer of 1909. By December of that year the work had progressed far enough to serve light experimentally, when a fire broke out and retarded the progress of work for about a month. The Changchun Works were opened to business on February 1st, 1910, with the service of only 2,318 lamps. The number increased to 8,357 at the end of that year, to 9,330 at the end of 1912, and further to 10,123 at the end of last September. This increasing tendency is still operating steadily.

New Enterprises.—The work of erecting the poles for the Wuchang Electric Works, it is expected, will be commenced in another two months. In the meantime the foundations for the station have been laid and the walls of the buildings are beginning to rise. Throughout the city are posted proclamations issued by the Wuchang government informing the people that they may expect the erection of the overhead wiring very shortly. They are ordered to aid the workers in every way and not to hinder the placing of the poles, as the company has full right to put them where they like. The contract for the erection of this plant was given to Siemens China Electric Engineering Company, and it will be one of the most modern in China. The installation will be completed about the end of next year.

Unlike the Hankow Waterworks the new Wuchang waterworks is to be entirely electric-powered, the power being obtained from the same plant as the light. The waterworks is to be situated on Chang Chih-tung's concession below the city, and the water is to be taken from the river. Now that permission for the erection of the plant has been obtained from both provincial and central governments, Mr. M. Engel, from the Shanghai Waterworks Company, who has obtained the contract, is starting work this year, and it is expected that the city will have water laid on in about a year's time. The replacing of steam by electric power will both cheapen the initial price of the plant by some Tls. 10,000 and will cut down the land required to a minimum. The running expenses are estimated to compare very favourably with those of steam, as the Wuchang Electric Light Company on account of supplying on a large scale, will be able to supply power at a cheap rate.

Hanyang Arsenal is to be fitted, we are informed, with the most modern electric plant in China. The contract for the electric machinery has been given to Siemens China Electric Engineering Company. The notable feature of the new plant will be the steam turbine driven dynamos. The power manufactured will drive motors as well as light the place. The whole arsenal is to be electric-powered. The plant will be a high-tension one of 3,000 volts. In consequence of dissatisfaction with Yangtse water in condensers in the several plants along the river banks, the necessity of this will be avoided in the Hanyang works by a water cooling tower.

Part of the electrical machinery has already arrived out. The plans of the power house have already been drawn up and the work of erecting is to commence at once.

Forty thousand taels is about the contract price for the installation of the electric power plant at the salt miinng town of Tseliutsing, in Szechuan, as reported elsewhere. The plant is to be three phase generators developing 5,000 volts. The high tension is required to transmit the power over considerable distances to neighbeuring towns and in the salt mining operations. The town of Tseliutsing is to be lit throughout with electricity, the power for local require-

ments being transformed to 220 volts. The machinery is now on its way out, and The Siemens China Electric Engineering Company, who obtained the contract, expect to send their electrician to Tseliutsing shortly.

In connection with this plant it is interesting to know that another in Chengtu, further inland, was also erected by the same firm and is at present working.

The Changsha electric plant has proved inadequate for the demand, and an extension has been put to it by the Siemens Company. The extension generates above 300 horse power.

Kobe Electric Company.—The working of the Kobe Electric Company for the last half-year was quite satisfactory, and the company is able to pay a divided of more than 6 per cent. per annum, but the dividend will be limited to that figure, more money being put to the reserve fund and carried forward in order to strengthen the foundation of the company. It is stated that the company has on foot a scheme to raise a foreign loan or to negotiate a temporary loan in order to obtain the funds required for carrying out the proposed extension of the tramway system.

Philippine General Electric Co.—In order to extend the business in the products of the General Electric Company of Schenectady, in the Philippines a company called the Philippine General Electric Company has been incorporated with a capital of Pesos 100,000.00, divided into 1,000 shares of Pesos 100 each.

The main shareholders in the new company are The Frank L. Strong Machinery Company and the Pacific Commercial Company, who are the two largest machinery importers into the Islands. The business of the General Electric Company has in the past been exclusively handled by the Frank L. Strong Machinery Company, but owing to its rapid growth in recent years the need of additional capital to work this branch has been felt. The General Electric Company are not financially interested in the new company which will be a purely local concern. The articles of association have been very liberally drawn so as to permit of the Company engaging in all branches of the electrical field.

The first directors of the Philippine General Electric Co. are F. L. Strong, J. M. Switzer, R. E. Clark, D. R. Williams, F. A. Leas, and E. B. Bruce.

MINING

Kailan Mining Administration.—The Kailan Mining Administration's total output for the week ended November 8 amounted to 49,219.16 tons and the sales during the same period to 39,769.44 tons.

Week ended November 15, output 48,957.34 tons, sales 42,763.82 tons.

Week ended November 22, output 50,907.59 tons, sales 44,218.57 tons.

Week ended November 29, output 52,811.43 tons, sales 57,389.58 tons.

Copper Mine in Kiangsi.—Mining work has been started by Mr. Liu Sin-sen, compradore of the Banque de l'Indo-Chine, on a copper mine which he bought last year at a place called Changloyuan on the Kiangsi border, says the "C. C. Post." Some 150 ft. has been already excavated, and it is expected that the workers will strike ore when the shaft is sunk another 100 ft. According to present arrangements, when it is proved the mine is genuine, shares will be floated on the market and the mine properly developed.

Mineral Output in Japan.—According to the Department of Agriculture and Commerce the yield of principal minerals in Japan witnessed a falling off by ½ per cent. as compared with the same time last year during October last, the details being given below :—

Gold	120,618	momme.
Silver	2,939,217	„
Copper	9,312,319	kin.
Iron	1,521,850	kwan.
Coal	4,592,100	tons.
Petroleum oil	131,649	koku.
Sulphur..	7,990,692	kin.

The figures for the ten months ending October 31st also show a falling-off by ½ per cent. as compared with the same period of last year. Details are as under :—

Gold	1,032,947	momme.
Silver	32,513,862	„
Copper..	82,469,284	kin.
Iron	14,421,343	kwan.
Coal	15,234,127	tons.
Petroleum oil	1,288,130	koku.
Sulphur	69,478,136	kin.

Hupeh Coal Mine.—The *Central China Post* reports that samples of anthracite coal apparently of very fine quality, have arrived in Hankow from a new mine opened three hundred and eighty *li* up the river from Hankow. The Ing Mow Wai Coal Mine, as the mine is called, is expected to be got into working order about March next year, when a turnout of between seven hundred and eight hundred tons a month is predicted. The borings have already struck a three-foot seam of hard coal, we are informed, and the first shipment is expected to arrive at Hankow shortly.

The Ing Mow Wai coal mining concession was granted to some wealthy Chinese from the North in 1908. Preliminary machinery for boring was installed, the contract for which was given to the local firm of Messrs. Burtenshaw and Company, the value being about Tls 11,300. The work of boring was immediately started upon, but on the death of one of the principals in December 1909 the other partners gave over the work and the concession was taken over by Messrs. Burtenshaw and Company. Further machinery to carry out the boring in a more extensive scale was brought out, but in 1911 the revolution put a stop to the erection work. However, as soon as conditions quietened down, the work was again taken up under the supervision of a German engineer.

Two shafts have now been sunk, one to a depth of sixty-four feet and the other to about forty-eight feet. A seam of hard anthracite about 3 ft. 2 in. in breadth has been struck in the deeper shaft. The intention is to incline the first shaft to a depth of between one hundred and seventy or eighty feet and sink another, a third shaft.

The plant at the mine head is said to be on modern lines. Anthracite being of little or no use as a steam producer, power is to be obtained from suction gas engines, which will delvelop electricity. This will be employed not only in working the mine machinery but will light the mine. In all some hundred and eighty-five glow lamps and eighteen arc lamps are to be installed. The danger from flooding is believed to be remote, as the mine is in hill country, but as an emergency and to contend with water from tapped springs there are two electric-driven centrifugal pumps, which have a capacity of five hundred and eighty gallons a minute against a head of 420 feet.

The mine being inland from the Yangtse, there is the drawback of adequate transport facilities, but arrangements are under way for a small railway from the mine mouth to the river's edge. From there the coal will be transported to Hankow in boats. Messrs. Burtenshaw and Company have arranged for an agency in Shanghai.

The quality of the coal, by the samples, is more of the household variety. It is said to be free from surphur and carbon dioxide. The price, it is expected, will compare favourably with that of coal already on the Hankow market.

PERSONAL

Sir John Jordan, British Minister at Peking, presented his credentials to President Yuan Shih-kai on December 4.

Mr. J. A. Thomas, managing director of the British-American Tobacco Company, has received the 6th grade of the Chia Ho Order for services rendered to the Chinese Government.

Mr. Frank W. Carpenter has been appointed Governor of Moro Province, Philippine Islands.

Mr. Richard Wood Randolph has been appointed acting Engineer-in-Chief of the Ichang-Kweichow section of the Hankow Szechuan Railway.

Mr. G. C Hanson, in the American Consular service, now at Chefoo, is to succeed Mr. A. W. Pontius as American Consul at Dairen. Mr. Pontius has been appointed Consul at Nanking.

Mr. Ryutare Nomura, Vice-President of the Japanese Railway Board, and Mr. Daihachi Ito, a Seiyukai member of the House of Representatives, have been appointed President and Vice-President, respectively, of the South Manchuria Railway.

Mr. W. T. Price, headmaster of the Thomas Hanbury School at Shanghai, has been appointed headmaster of the Customs College in Peking.

The President has appointed General Chang Hsun Inspecting Commissioner on the Yangtze and General Feng Kuo-chang Tutuh of Kiangsu.

In response to the application of Vice-Admiral Li, at Shanghai, the President has sanctioned the installation of wireless telegraphy on twelve men-of-war. Vice-Admiral Li has now asked for permission to instal apparatus on other ships.

The Amur Railway has been opened to Blagovestchensk.

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Experienced and responsible New York firm, now buying for important foreign interests and enjoying favorable relations with manufacturers—especially in Railway Materials and Equipment—can handle other accounts to advantage. It is hoped this announcement may favorably interest Railways, firms or individuals needing, in the United States, agents capable of giving better than the usual attention to purchases and shipments from that country. Unquestionable references will be furnished. All correspondence considered confidential.

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THE FAR EASTERN REVIEW

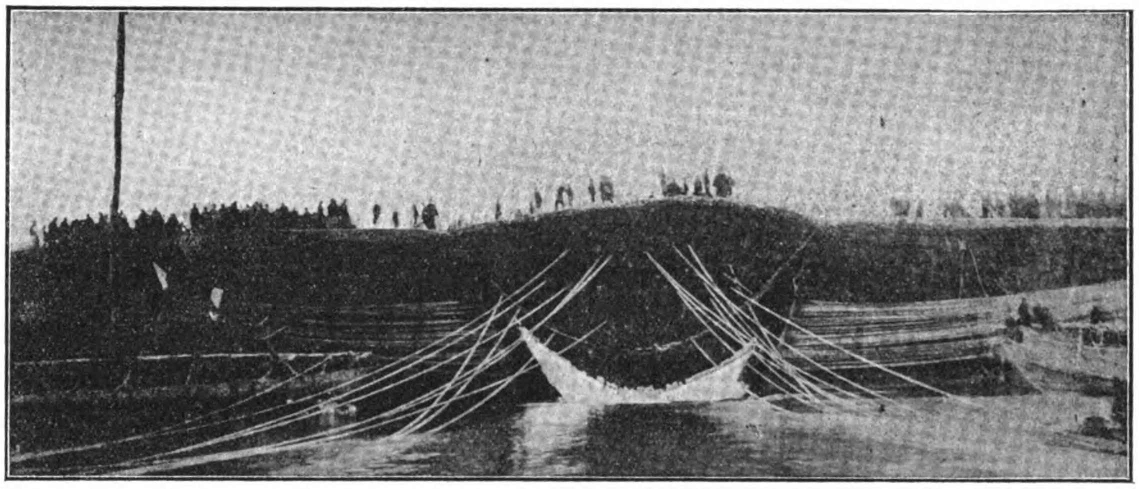
COMMERCE :-: ENGINEERING :-: FINANCE

VOL. X. SHANGHAI AND MANILA, JANUARY 1914 No. 8

NATONAL IRRIGATION AND CONSERVATION IN CHINA

THE MARVELLOUS CANALS OF THE COUNTRY

Just before Christmas, 1913, the Chinese Premier, Mr. Hsiung Hsih-ling; the Minister of the Interior, Mr. Chu Chi-chien ; and the Minister of Commerce and Agriculture, Mr. Chang Chien, jointly memorialised the President, His Excellency Yuan Shih-kai, to establish a National Irrigation and Water Conservation Bureau with the object of properly investigating and dealing with the irrigation and conservation problems that are constantly confronting the Government, and which to date have not received the attention they deserve owing to the absence of a special bureau for the purpose. The President was so impressed with the arguments of the memorialists that within three days he issued a mandate creating the bureau, and appointing Mr. Chang Chien, the Minister of Commerce and Agriculture, to preside over it. This is a step which will be welcomed by all who have knowledge of the tremendous losses periodically suffered by millions of Chinese living in low-lying areas, and the great death rate and intense suffering which result from famines supervening upon floods.



Repairing a Breech in Dyke of Yellow River

MEMORIAL FOR A NATIONAL BUREAU

The memorialists dilated upon the extraordinary and marvellous undertakings of ancient rulers in China to preserve the low lands from the ravages of flood, to make the arid wastes productive by scientific irrigation, and to open communication with distant parts by the construction of elaborate canals, and emphasised the neglect which had in recent generations almost nullified the magnificent foundations laid by the wise rulers of the old time. To impress upon the President the immediate need of special attention being given to these problems the tremendous losses suffered in recent years in what is known as the Hwai River famine districts were cited. Chang Chien was appointed General Director of the Drainage Work of the Hwai River in 1912, they pointed out, and his special instructions from the Government were to continue the surveying work commenced in 1911, to estimate the cost of flood prevention measures, and to negotiate for the necessary capital with the object of commencing work without delay.

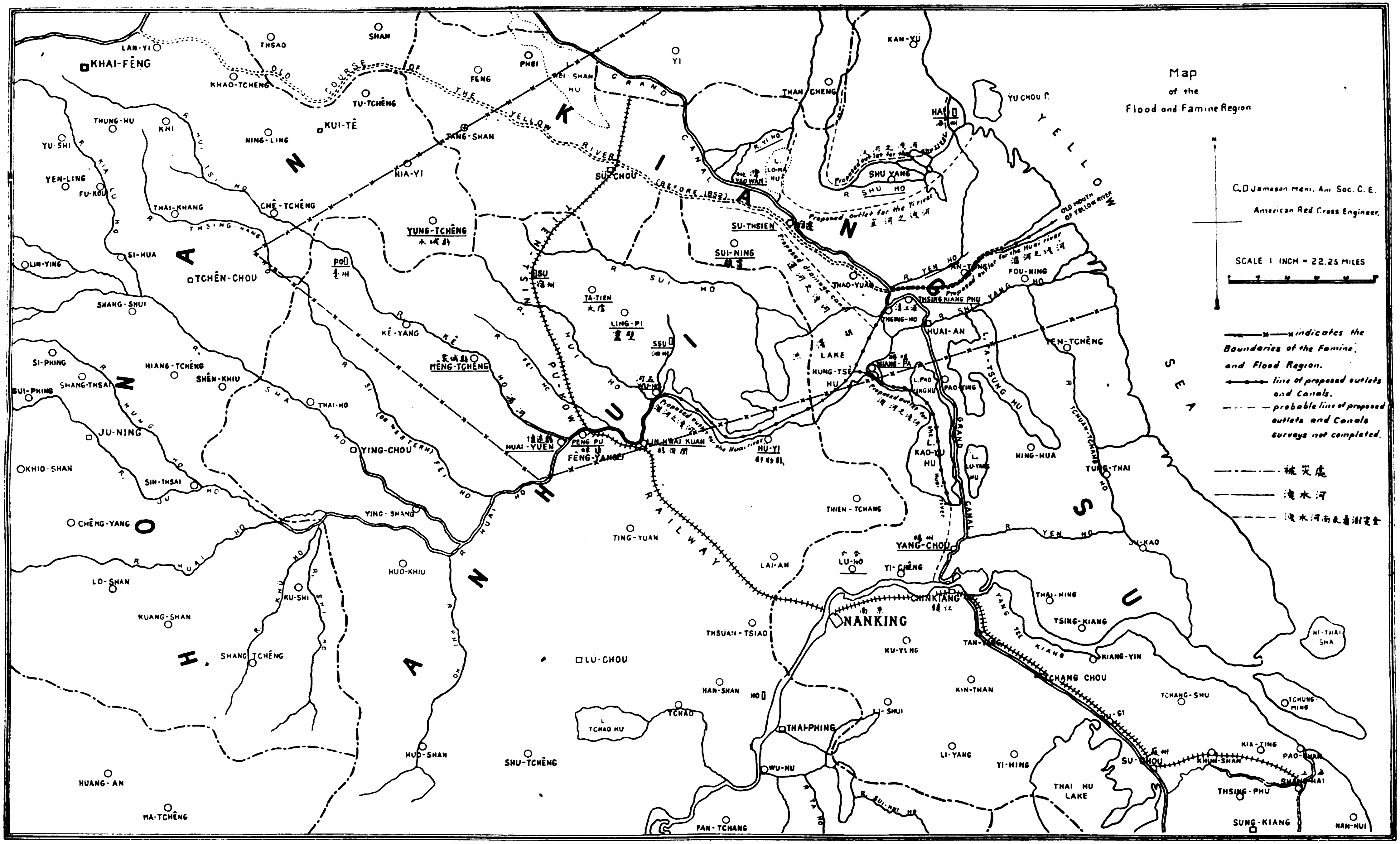
Suffering and loss of life and property was not confined to the region of the Hwai River, however. It existed in many widely separated sections of the country, and with the object of giving the whole subject adequate attention, and preventing the charge that partiality was shown to the unfortunates in the Hwai district, the supplicants urged that a National Bureau be established.

In their opinion the concentration of energies would result in great benefits to the millions of people populating the areas affected by flood or drought, and since the Hwai River area called loudest for attention it could be given first consideration, and while that work was proceeding preliminary steps could be taken in other places.

THE PRESIDENT'S MANDATE

In his mandate of December 27, 1913, giving effect to the memorial of the three Cabinet Ministers the President spoke of the great benefits accruing from irrigation, and went on:—"The lands along the big lakes and rivers are the most productive, but owing to lack of irrigation one sees the best lying in waste. Other tracts, either on the coast or along the rivers, are also wasted, some because the beds of the rivers heighten, others through the inundation of water from the sea. Great dangers are imminent while no preventive measure is taken, thus great benefits are in store which cannot be taken advantage of. Though works of a palliative nature are resorted to now and again nothing is done for lasting good. By comparing the work of irrigation which was done in the past with that of the Chow Dynasty, and with what is now being done in foreign countries, it becomes evident how enormous is the waste in this country. The evil is due partly to the corruption of the officials and ignorance of the people, but is mainly due to local cliquism which hinders and hampers all good works in that direction. During

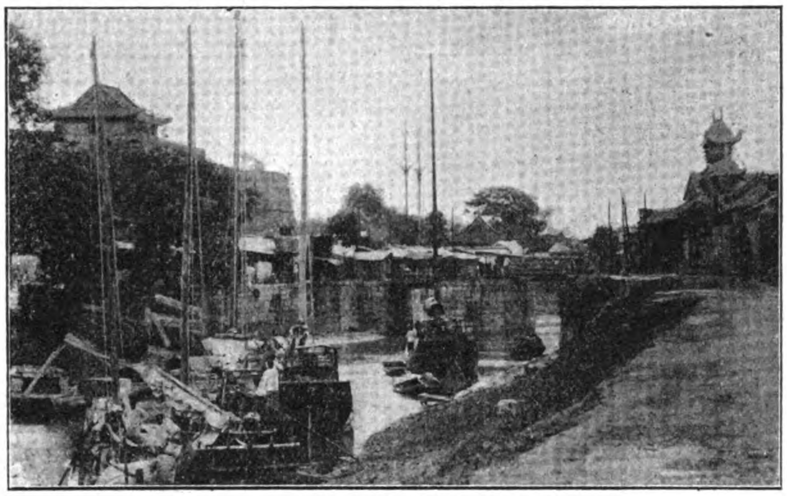
MAP OF THE HWAI RIVER FLOOD AND FAMINE REGION



The above map was prepared by Mr. C. D. Jameson, who made a reconnaisance of the flood and famine affected area with the object of suggesting preventive measures. Mr. Jameson was engaged by the American Red Cross Society, and the report he submitted was published in full in the November, 1912 number of the FAR EASTERN REVIEW.

the reign of Kan Hsi, Jen Fu, in a memorial to the Throne, suggested the means of increasing revenue, but in spite of the diligence of the Emperor, the effort to increase the wealth of the people by improving the land was left incomplete.

"Now that the form of government is changed the acts of the local bad characters possessing influence cannot be tolerated. The population of our country is large and increasing, and the means of subsistence is getting more and more difficult to obtain. Consequently idle people collect together to create trouble. We must therefore adopt the work of irrigation on an extensive scale and select good officials to impress upon the people the importance of agriculture in order that they may be employed, contented, and enabled to practice economy. During my retirement at Yuan Shan as a farmer, I facilitated the waterways, and the work done benefitted some thirty-two thousand mow of the surrounding land. It will be seen from this that the benefit irrigation will confer is very great.



Lock on the Grand Canal at Tsining

"We have now established an Irrigation Bureau. The Director of the Bureau is hereby instructed to order the officers of the provinces to make surveys of the depths of the rivers as a preliminary to dredging, and dredging work should be undertaken first in the ports in order to facilitate the currents of the rivers. The work of irrigation in connexion with the large rivers will be undertaken by the Government, while those of the riverlets and lakes, etc., etc., should be taken up by local bodies to be formed for such purposes. By improving the waterways the farmers will be free from the fear of flood or famine, the agricultural products will increase, the wasted lands will decrease and the idle people will be employed. The prosperity of trade marts, ports and sea navigation are also dependent on the dredging of the mouths of rivers. So it is important that a careful investigation should be made into the matter. The Bureau is instructed to devise means and to report without delay."

CONSTITUTION OF THE BUREAU

In a mandate issued on January 8, the President set out the system under which the Bureau is to be governed. It is to be under the direct control of the Cabinet, and "shall manage the irrigation affairs of the whole country and the reclamation of waste lands along the banks of the rivers."

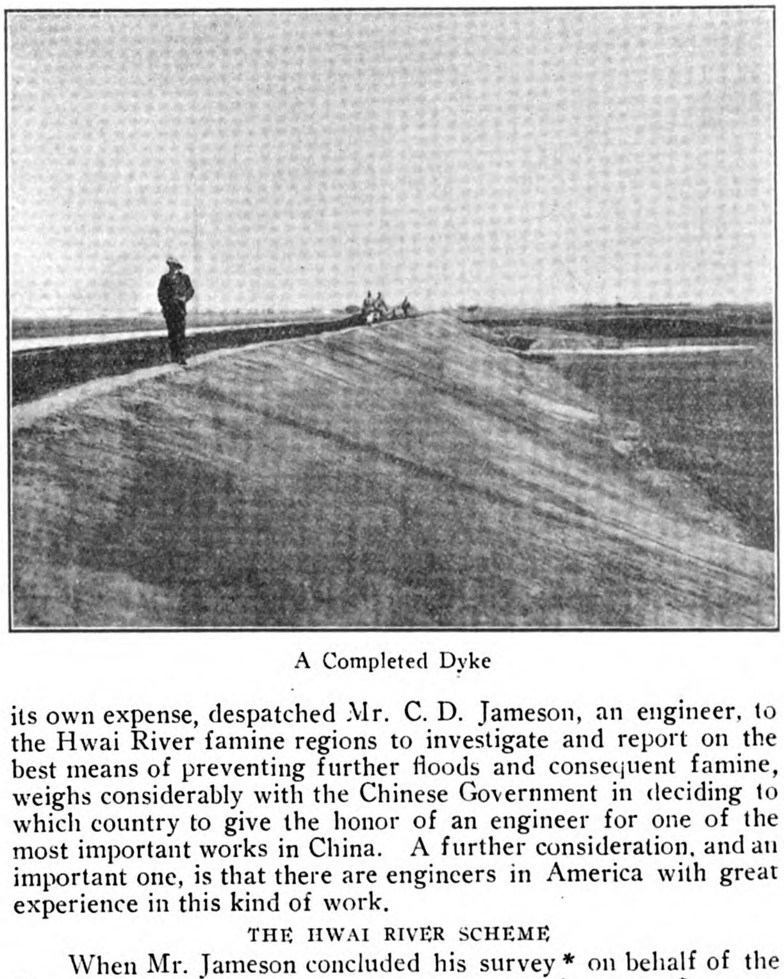
The staff is to consist of the Director-General (Mr. Chang Chien); an Assistant Director-General, whose duty it will be to assist in the general management and take the place of the Director-General when he is absent: two supervisers, whose duty it will be to supervise various works, and, if they be not sufficient others may be appointed; between two and six senior clerks who shall be employed in working out the details connected with the management of the Bureau; between eight and twelve clerks to assist the senior clerks; between two and six technical experts to manage all technical affairs; between ten and sixteen experts to assist the technical experts. The mandate, however, places in the hands of the chiefs of the Bureau the appointment of extra assistants under the heads mentioned should they be necessary, and "on account of the requirement of technical knowledge the Irrigation Bureau for the whole country may employ advisers at its own discretion," and when branch offices are appointed chiefs may be appointed to manage them.

The above is as far as the mandate goes in connection with the establishment of the Central Bureau, and makes no stipulations as to where branch offices shall be opened. Mr. Chang Chien has, however, already considered this question, and so far has in mind the creation of thirteen branches in Chihli, Shantung, Hunan, Hupeh, Szechuan, Kiangsi, Anhui, Chekiang, Kiangsu, Fukien, Kuangtung and Kuangsi provinces.

The expenses connected with the maintenance of these bureaux will be met by the Provincial treasuries, while the funds for the upkeep of the Central Bureau at Peking will come from the Central Government. Capital for the carrying out of various flood prevention or irrigation schemes will be raised by foreign loans.

AMERICAN ENGINEER-IN-CHIEF PROBABLE.

A point of considerable interest to foreigners in this connection is the probable nature of the engineering staff. At present Mr. Chang Chien has in mind the selection of a thoroughly competent foreign engineer as Engineer-in-chief, and in all probability assistant foreign engineers will be appointed, with staffs of Chinese engineers to undertake any special schemes that may be embarked upon. The Director-General of the Bureau contemplates appointing a prominent American engineer as Engineer-in-chief, but so far no selection has been made. One of the chief reasons why an American stands the best opportunity of selection for this important position is the feeling on the part of the Chinese Government that some sign of gratitude is due America for the immense amount of money, of food, of clothing and of human endeavor which the American people have from time to time contributed in the famine regions to ameliorate the terrible lot of the hunger and fever-stricken natives. American people have done more than any others in this direction, and that fact, combined with the one that the American Red Cross Society, at its own expense, despatched Mr. C. D. Jameson, an engineer, to the Hwai River famine regions to investigate and report on the best means of preventing further floods and consequent famine, weighs considerably with the Chinese Government in deciding to which country to give the honor of an engineer for one of the most important works in China. A further consideration, and an important one, is that there are engineers in America with great experience in this kind of work.



A Completed Dyke

THE HWAI RIVER SCHEME

When Mr. Jameson concluded his survey* on behalf of the Red Cross Society he estimated that work costing some $35,000,-

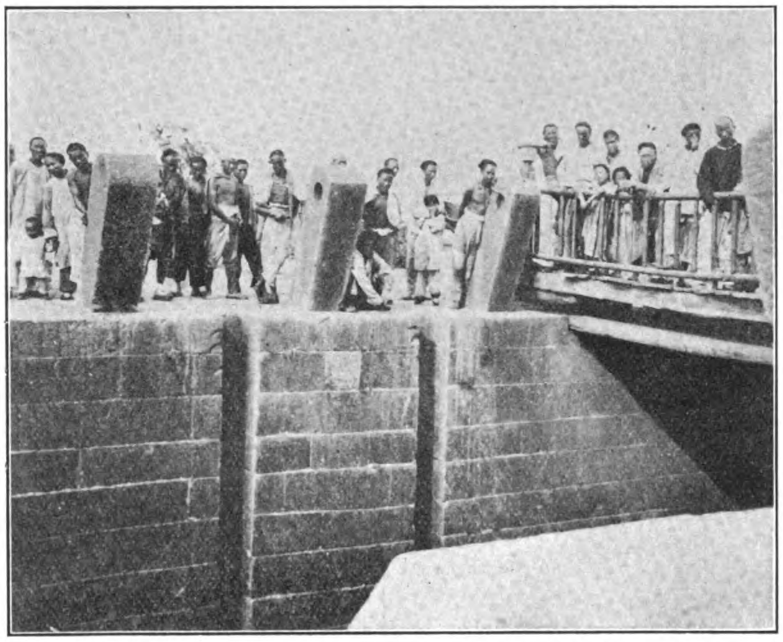
* The full report by Mr. C. D. Jameson was published in the November, 1912, issue of the FAR EASTERN REVIEW.

000, Mexican currency, would be required adequately to protect the region affected by the floods of the Hwai River alone. That amount of money would, however, render 17,000 square miles immune from abnormal floods by draining the area and lowering the flood level to such an extent that in all but abnormal years two crops would be possible each year, where, under present conditions, two crops in five years is the rule. In addition to this improvement in land which is now supposed to be under cultivation there would also be reclaimed some 6,000,000 Chinese *mou* of land which is now absolutely valueless, being covered by shallow lakes and swamps. There would also be a saving of the cost of the annual famine relief which for many years has been poured by millions and millions of dollars into this section of China. The moral results would be the elimination of the suffering, starvation and degeneration of several millions of people who now are fast becoming beggars and robbers; the turning into producers of these millions who are now not only non-producers, but who are becoming a menace to the country and causes of unrest and lawlessness.

So important is this Hwai River scheme that it will be the first to be dealt with by the new Bureau. Mr. Chang Chien has in the past personally devoted much attention to it, and has been the director of much effort to acquire a knowledge of conditions and to devise a plan whereby the maximum of good may be secured.

The map which accompanies this article was drawn by Mr. Jameson for the purpose of illustrating the affected region, and it will be instructive as showing the vast areas which are now at the mercy of the elements and which, by sustained and intelligent employment of modern contrivances and wide experience, might be preserved for the use of peoples annually despoiled of means of existence through no fault of their own.

In the past huge sums have been granted by the Central Government for flood preventive measures, but as stated by the President, corruption has diverted the bulk of the funds from their proper use. It is trusted that the newly established Bureau will bring about a marked change in this respect, and will, by up-to-date methods, conquer the giants which have hitherto scourged the people and which, in the past, have been used as a pretext by officials for amassing large amounts of money for their personal use.



A Grand Canal Lock. The grooves in which the timber baulks are placed to raise the water are here well shown.

"CHINA'S SORROW."

While the treatment of the Hwai River region will employ a great sum of money and considerable energy, there are many other sections of China almost equally bad, and which call for extensive effort. That great scourge, the Yellow River, known variously as "China's Sorrow," "The Ungovernable," and "The Scourge of the Sons of Han," is a constant menace to millions of people and hundreds of thousands of square miles of territory. In what might be called its lower course, through Honan and Shantung, it constantly threatens to overflow the artificial banks which contain its turbid waters and which hold its bed many yards above the surrounding plains. As month after month passes the mud and sand which the river carries with it continually raise the bed, and the patient Chinese whose lives and property depend upon constant care are compelled continuously to heighten the embankments and plan, by building outlying dykes, to prevent a great inundation if the immediate embankments are broken by flood.

The speciality of this river is to change its course. Frequently it has run to the north or to the south of the Shantung mountains, flowing in turn either into the Gulf of Chihli or into the Yellow Sea. Its last serious deviation took place in 1851, when the dykes near Kaifeng gave way and the great stream wandered away north as a change from its previous southerly direction. In 1887 it caused loss of life to millions of people by bursting its banks, and in 1898, 1,500 villages to the north-east of Tsinanfu, the capital of Shantung province, experienced its ravages, while a larger region to the south-east of the same city was devastated.

Mainly the river seems to be running on a self-created elevated ridge, and at any time its past performances may be repeated. To prevent this the Central Government has a great task ahead of it, and a great duty. When the breach in the region of Tsinanfu occurred over 100 square miles of territory were converted into a sandy waste of almost absolute sterility, while over an area of some 200 miles a deposit of more or less sterility was laid. Captain W. F. Tyler, of the Maritime Customs, who wrote a report on this inundation, estimates that an average depth of sand of three feet was deposited over 200 square miles, and at the places where examination was possible it ranged from six to ten feet. Taking an average of five feet the river discharged at this time 28,000,000,000 cubic feet of silt. Captain Tyler calculates that the sediment borne by this river is incomparably greater than in any other river in the world. River officers say that in floods the fluid mass is from 50 to 70 per cent. solid matter and has the consistency of oil! The sand and mud is not a mere sediment left by subsiding waters; it is a vast stream of liquid mud poured from the river bed.

Annually this condition of things goes on, and increases the terrors impending over the regions traversed by this river. The amount of silt brought down is on the increase; the flood volume is on the increase, and the low-river volume is on the decrease. As the river bed rises so does the quantity of water which exfiltrates increase, and the ability of the river to carry its load of silt to the sea becomes less and less.

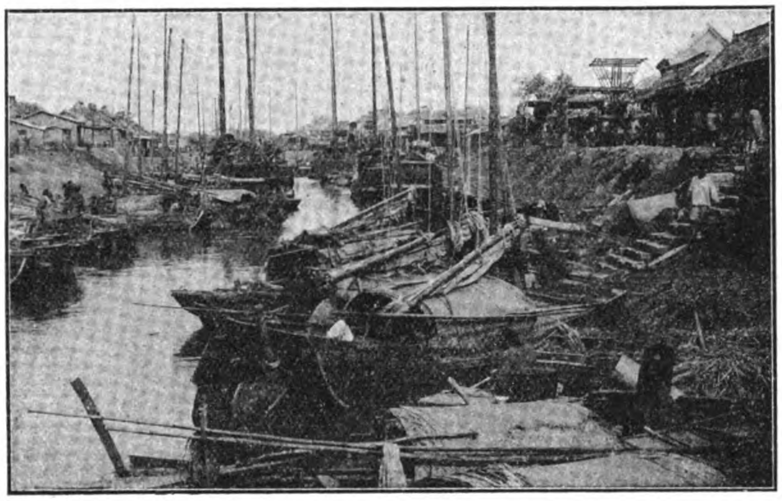
A TASK FOR THE BUREAU

The question of silt is the dominant factor in the Yellow River problem, and the first and most obvious remedial scheme would be to try and make the water carry the silt down to the sea—to straighten the bends by training work and to bring the low and high river channels to sections best adapted to the volumes. Another scheme is to take steps in the upper part of the river, in Honan, Shansi, and Shensi, to mitigate the erosion of the river banks and that of its tributaries, and, by afforestation, to ameliorate the torrents and cause a more regular flow from the now denuded uplands. Such a work is of such immense magnitude, and as regards afforestation, would take so many years to have any appreciable effect, that Captain Tyler thinks it outside the limits of a scheme for the control of the Yellow River within the lifetime of the present generation.

But to find some way to overcome the dangers with which this great river is constantly menacing large sections of China is one of the tasks which will come under the Bureau now formed, and before very many years are over it is a task which the Government will have seriously to tackle. The temporary efforts made by provincial authorities to control the river are estimated to cost in the vicinity of three and a half million taels, and result in no guaranteed safeguarding of life and property, while the annual destruction of property by the river may be placed at about one and a half million taels. These are the figures used by Captain Tyler, but they do not take into

account an abnormai flood which at any time may burst the great dykes, though he significantly states that the three and a half million taels properly handled might suffice to prevent any great disaster.

The warmest praise must be given the Chinese engineers who have had in their hands the business of looking after the frolics of this great river, and the illustration in this issue showing the closing of a breach in the dyke at Liu-wang-chuang in September, 1902, is highly instructive. Captain Tyler, in describing this particular piece of work, says that some 1,500 yards of the dyke were washed away and the greater part of the water flowed through the breach. The closing was effected



Grand Canal at Tsining in Shantung

in the following manner: a dam was run out from either side of the breach by the successive building of pakwerks—layers of kaoliang (giant millet) stalk and earth. When these approached within 55 feet of each other a huge deflecting groyne of pakwerk was built on to the up-river dam to minimise the rush of water through the aperture. The width of the channel abreast of the breach had been about 600 feet, but this was reduced to less than 300 feet by the formation of a sandbank growing out from the opposite shore. When the entrance had been constricted to 55 feet, ropes were stretched across and belayed to anchor-piles. Over 100 eight-inch ropes were used, spaced close together. On these were then placed, in alternate layers, kaoliang stalks and sacks of clay. When these materials were up to the level of the dam, the ropes were manned, and at a given signal, were each lowered one foot on each side. The mattrass thus formed was again added to with kaoliang and clay and again lowered, and so on till the breach was closed. The deflecting groyne used to minimise the rush of water is described as a remarkable structure, projecting 120 feet into the full strength of the current and tied up to the kaoliang dam by an immense number of eight-inch hawsers.

OTHER FLOOD REGIONS—AND FUNDS

In addition to the Hwai River and the Yellow River menaces the new Bureau will also have to take care of many other regions where floods continually deprive the inhabitants of their property and livelihood, and the silting waterway obstruct communication. An important district is that of north Chihli, where annual floods devastate large tracts. There are others in various provinces, and if the Bureau but deals with a tithe of the work of this kind which should be done it will have its hands full and will have more than sufficient to absorb the funds that can be supplied for the purpose by the Government or the provinces. To cope with the Hwai River scheme, in fact, foreign money will be needed, and the proposal now being considered is whether a sum of $20,000,000 United States currency can be raised in America as a loan for the purpose. The feeling here is that it would be difficult to float such a loan, but as the Red Cross Society have taken a lively interest in the subject it is probable that they might be able to engineer a loan upon a semi-philanthropic basis, putting charity on a business footing as it were. The loan would be secured upon the reclaimed land, and the land taxes or some other form of revenue, would be set aside to pay the interest and repay the principal. At this writing the whole question is being considered, but the establishment of the Bureau brings it on apace. It should not be long before a decision is arrived at, and if Belgian offers are not too attractive to the Chinese, or if the Chinese have not forgotten the gratitude they owe America for relief to their suffering millions in the past, American philanthropists or capitalists, or both, will be asked to provide the necessary loan.

While the extensive flood areas are receiving consideration the Bureau will be compelled to give considerable attention to the great canal system of the country, a system which was once the glory of the designers, and, of immense advantage to the inhabitants, but which is now a standing monument to the neglect of recent rulers of the country. The Grand Canal, one of the wonders of the world, has silted so as to be unnavigable in parts, and hundreds of miles of canals in other localities may be navigated only when there are floods. The great importance of these canals for transport should compel attention to them, and while the dredging work is monumental it should be easy of rapid accomplishment by the employment of modern dredgers to assist the manual labor that may be employed in places to advantage.

The Wonderful Canals of China

The great extent of these canals—almost all of which require dredging or attention in other ways—is only realisable by a study of maps and accumulated data. Something of this kind was prepared by the late professor F. H. King, and his observations are here given as an important contribution to the literature on the subject. Professsor King, in his book "Farmers of Forty Centuries," published privately after his death by Mrs. King, at Madison, Wisconsin (450 pages and 250

Working a Lock. This view illustrates the methods adopted to haul a Junk through a lock. Wire ropes are attached to the Junk and are wound on windlasses by the country people.

illustrations, $2.50 U. S. currency) dealt at considerable length with the canal system of China and other countries in the Far East, and much of what he had to say was reproduced in the "National Geographic Magazine," of Washington, from which we take the following :

It is well nigh impossible by word or map to convey an adequate idea of the magnitude of the systems of canalization, delta, and other lowland reclamation work, or of the extent of surface fitting of fields which have been effected in China, Korea, and Japan through the many centuries and which are still in progress. The lands so reclaimed and fitted constitute their most enduring asset and they support their densest populations.

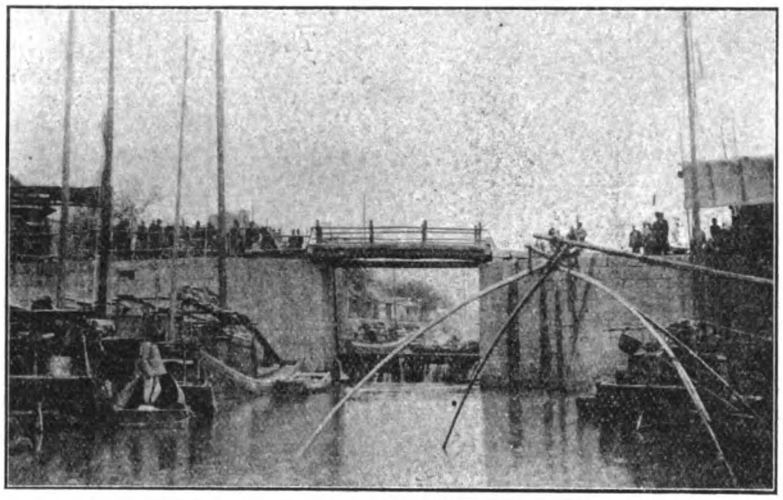
Forty canals across the United States from east to west and sixty from north to south would not equal in number of miles those in these three countries to-day. Indeed, it is probable that this estimate is not too large for China alone.

In one of our journeys by house-boat on the delta canals between Shanghai and Hangchau, in China, over a distance of 117 miles, we made a careful record of the number and dimensions of lateral canals entering and leaving the main one along which our boat-train was traveling. This record shows that in 62 miles, beginning north of Kia-hsing and extending south to Hangchau, there entered from the west 134 and there left on the coast side 190 canals. The average width of these canals, measured along the water line, we estimated at 22 and 19 feet, respectively, on the two sides. The height of the fields above the water level ranged from 4 to 12 feet during the April and May stage of water.

The depth of water after we entered the Grand Canal often exceeded 6 feet, and our best judgment would place the average depth of all canals in this part of China at more than 8 feet below the level of the fields.

On map No. 1 representing the area of 718 square miles in the region traversed, all lines shown are canals, but scarcely more than one-third of those present are shown on the map. Between A, where we began our records before reaching Kia-hsing, and B, near the left margin of the map, there were 43 canals leading in from the up-country side instead of the eight shown, and on the coast side there were 86 leading out into the delta plain toward the coast, whereas but 12 are shown.

Again, on one of our trips by rail from Shanghai to Nanking we made a similar record of the number of canals seen from the train close along the track, and the notes show an occurrence of 593 canals in a distance of 162 miles, an average of more than three canals per mile for this region and that between Shanghai and Hangchau.



Lock on Grand Canal at Tsining

The extent, nature, and purpose of these vast systems of internal improvement may be better realized through a study of the next two sketch maps. The first (map No. 2) represents an area 175 by 160 miles, of which map No. 1 is the portion enclosed in the small rectangle. On this area there are shown 2,700 miles of main canals, but from our personal observations it is probable that there exists to-day in the area not less than 25,000 miles of canals.

THE FAR-REACHING TIDES

In the next illustration (map No. 3) an area of northeast China 600 by 725 miles is represented. The unshaded land area covers nearly 200,000 square miles of alluvial plain. This plain is so level that at Ichang, nearly 1,000 miles up the Yangtse, the elevation is only 130 feet above the sea. The tide is felt on the river to beyond Wuhu, 375 miles from the coast. During the summer the depth of water in the Yangtse is sufficient to permit ocean vessels drawing 25 feet of water to ascend 600 miles to Hankau, and for smaller steamers to go on to Ichang, 400 miles further.

The location in this vast low delta and coastal plain of the system of canals already described is indicated by the two rectangles in the southeast corner of the sketch map 3. The heavy barred black line, extending from Hangchau in the south to Tientsin in the north, represents the Grand Canal, which has a length of more than 800 miles. The plain to the east of this canal, as far north as the mouth of the Hwang-ho in 1852, is canalized much as in the area shown in map No. 2. So, too, is a large area both sides of the present mouth of the same river in Shantung and Chi-li between the canal and the coast.

Westward, up the Yangtse Valley, the provinces of Nganhwei, Kiangsi, Hunan, and Hupeh have very extensive canalized tracts, probably exceeding 28,000 square miles in area. Still further west, in Szechuan province, is the Chengtu plain, 30 by 70 miles, with what has been called "the most remarkable irrigation system in China."

A conservative estimate would place the miles of canals and leveed rivers in China, Korea, and Japan equal to eight times the number represented on map No. 2—fully 200,000 miles in all.

THE GREAT LEVEES

As adjuncts to these vast canalization works there have been enormous amounts of embankment, dike, and levee construction. More than 300 miles of sea wall alone exist in the area covered by the sketch map No. 2. The east bank of the Grand Canal about Yangchau is itself a great levee, holding back the waters to the west above the eastern plain, diverting them south into the Yangtsekiang ; but it is also provided with spillways for use in times of excessive flood, permitting waters to discharge eastward. Such excess waters, however, are controlled by another dike, with canal along its west side, some 40 miles to the east, impounding the water in a series of large lakes until it may gradually drain away. This area is seen in map No. 3 north of the Yangtse River.

Along the banks of the Yangtse, and for many miles along the Hwang-ho, great levees have been built, sometimes in reinforcing series of two or three at different distances back from the channel, where the stream bed is above the adjacent country, in order to prevent widespread disaster and to limit the inundated areas in time of unusual flood. In the province of Hupeh, where the Han River flows through 200 miles of low country, this stream is diked on both sides throughout the whole distance, and in a portion of its course the height of the evees reaches 30 feet or more.

Again, in the Canton Delta lregion there are other hundreds of miles of sea wall and dikes, so that the aggregate mileage of this type of construction works in the Empire can only be measured in thousands of miles.

In addition to the canal and levee construction works, there are numerous impounding reservoirs to control overflow waters from the great streams. Some of the interior reservoirs have areas of 2,000 and 1,800 square miles, and during the heaviest rainy seasons each may rise through 20 to 30 feet. Then there are other large and small lakes in the coastal plain, giving an aggregate reservoir area exceeding 13,000 square miles, all of which are brought into service in controlling flood waters, all of which are steadily filling with the sediments brought from the far-away, uncultivable mountain slopes and which are ultimately destined to become rich alluvial plains, doubtless to be canalized in the manner we have seen.

NEW LAND IN THE MAKING

There is still another phase of these vast construction works which has been of the greatest moment in increasing the maintenance capacity of the Empire—the wresting from the flood waters of the enormous volumes of silt which they carry, depositing it over the flooded areas, in the canals, and along the shores in such manner as to add to the habitable and cultivable land. Reference may be made to the rapid growth of Chungming Island, in the mouth of the Yangtsekiang, and the million people now finding homes on the 270 square miles of newly made land which now has its canals, as may be seen in the upper margin of map No. 2.

The city of Shanghai, as its name signifies, stood originally on the seashore, which has now grown 20 miles to the northward

Map No. 1.—Map of Main Canals in 718 square miles of Chekiang province. Each line represents a canal, but scarcely more than one third of those present are shown on the map.

and to the eastward. In 220 B.C. the town of Putai, in Shantung, stood one-third of a mile from the sea, but in 1730 it was 47 miles inland, and is 48 miles from the shore to-day.

The dotted line laid in from the coast of the Gulf of Chihli on map No. 3 marks one historic shore line and indicates a general growth of land 18 miles to seaward.

Besides these actual extensions of the shore lines, the centuries of flooding of lakes and low-lying lands has so filled many depressions as to convert large areas of swamp into cultivated fields. Not only this, but the spreading of canal mud broadcast over the encircled fields has had two very important effects, namely, raising the level of the low-lying fields, giving them better drainage and so better physical condition, and adding new plant food in the form of virgin soil of the richest type, thus contributing to the maintenance of soil fertility, high maintenance capacity, and permanent agriculture through all the centuries.

AN ENGINEER-EMPEROR

These operations of maintenance and improvement had a very early inception; they appear to have persisted throughout the recorded history of the Empire and are in vogue to-day. Canals of the type illustrated on maps Nos. 1 and 2 have been built between 1886 and 1901, both on the extensions of Chungming Island and the newly formed mainland to the north, as is shown by comparison of Stieler's atlas, revised in 1886, with the recent German survey.

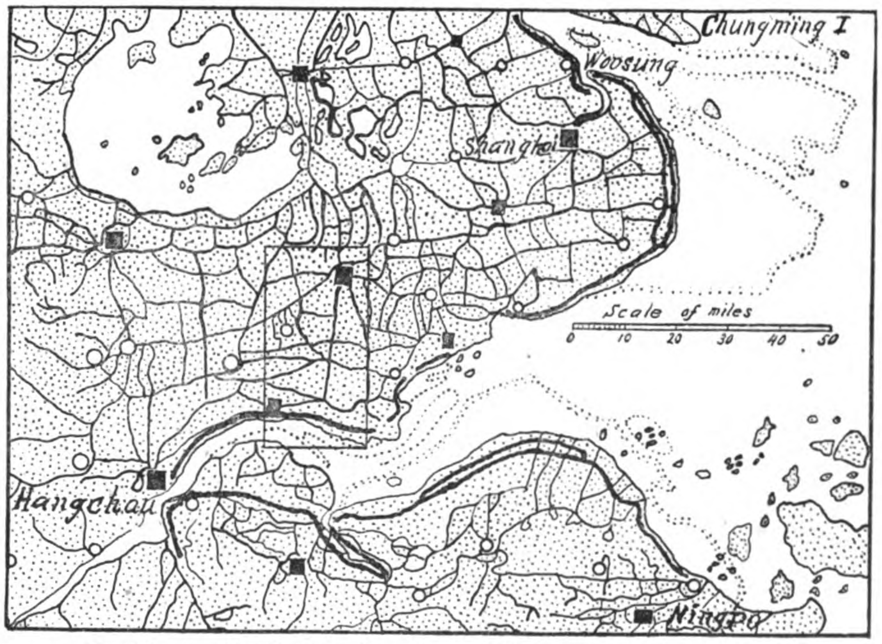
Earlier than 2255 B.C., more than 4,100 years ago, Emperor Yao appointed "The Great" Yu "superintendent of works," and entrusted him with the work of draining off the waters of disastrous floods and canalizing the rivers, and he devoted 13 years to this work. This great engineer is said to have written several treatises on agriculture and drainage, and was finally called, much against his wishes, to serve as Emperor during the last seven years of his life.

The history of the Hwang-ho is one of disastrous floods and shifting of its course, which have occurred many times in the years since before the time of the Great Yu, who perhaps began the works perpetuated to-day.

Between 1300 A.D. and 1852 the Hwang-ho emptied into the Yellow Sea south of the highlands of Shantung, but in that year, when in unusual flood, it broke through the north levees and finally took its present course, emptying again into the Gulf of Chihli, some 300 miles further north. Some of these shiftings of course of the Hwang-ho and of the Yangtsekiang are indicated in dotted lines on the sketch map No. 3, where it may be seen that the Hwang-ho during 146 years poured its waters into the sea as far north as Tientsin, through the mouth of the Pei-ho, 400 miles to the northward of its mouth in 1852. This mighty river is said to carry at low stage past the city of Tsinan, in Shantung, no less than 4,000 cubic yards of water per second and three times this volume when running at flood. This is water sufficient to inundate 33 square miles of level country 10 feet deep in 24 hours.

CANAL BUILDERS FOR CENTURIES

What must be said of the mental status of a people who for 40 centuries have measured their strength against such a Titan racing past their homes above the level of their fields, confined only between walls of their own construction? While they have not always succeeded in controlling the river, they have never failed to try again. In 1877 this river broke its banks, inundating a vast area, bringing death to a million people. Again, as late as 1898, 1,500 villages to the northeast of Tsinan, and a much large area to the southwest of the same city, were devastated by it, and it is such events as these which have won for the river the names "China's Sorrow," "The Ungovernable," and "The Scourge of the Sons of Han."

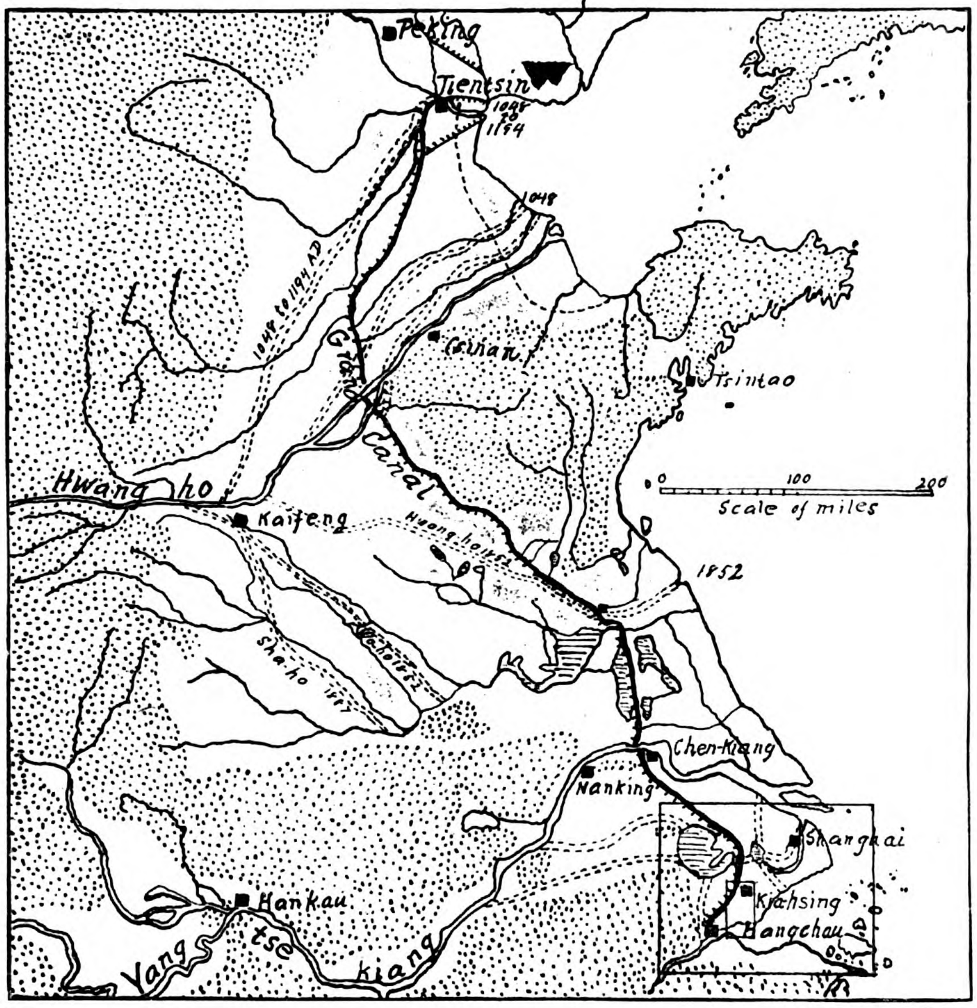


Map No. 2.—Sketch map of portions of Chekiang and Kiangsu Provinces. Representing some 2,700 miles of main canals and over 300 miles of sea-wall. The sea-walls are represented by the very heavy black lines. The area shown in the map contains not less than 25,000 miles of canals. The small rectangle shows the area covered by Map No. 1.

The building of the Grand Canal appears to have been a comparatively recent event in Chinese history. The middle section is said to have been constructed about the sixth century B.C.; the southern section, between Chinkiang and Hangchau, during the years 605 to 617 A.D.; but the northern section, from the channel of the Hwang-ho, deserted in 1852, to Tientsin was not built until the years 1280-1283.

While this canal has been called by the Chinese Yu-ho (Imperial River), Yun-ho (Transport River); or Yunliang-ho (Tribute-bearing River), and while it has connected the great rivers coming down from the far interior into a great water-transport system, this feature of construction may have been but a by-product of the great dominating purpose which led to the vast internal improvements in the form of canals, dikes, levees, and impounding reservoirs so widely scattered, so fully developed, and so effectively utilized. Rather the master purpose must have been maintenance for the increasing flood of humanity.

And I am willing to grant to the Great Yu, with his finger on the pulse of the nation, the power to project his vision for 4,000 years into the future of his race and to formulate some of the measures which might be inaugurated to grow with the years and make certain perpetual maintenance for those to follow.

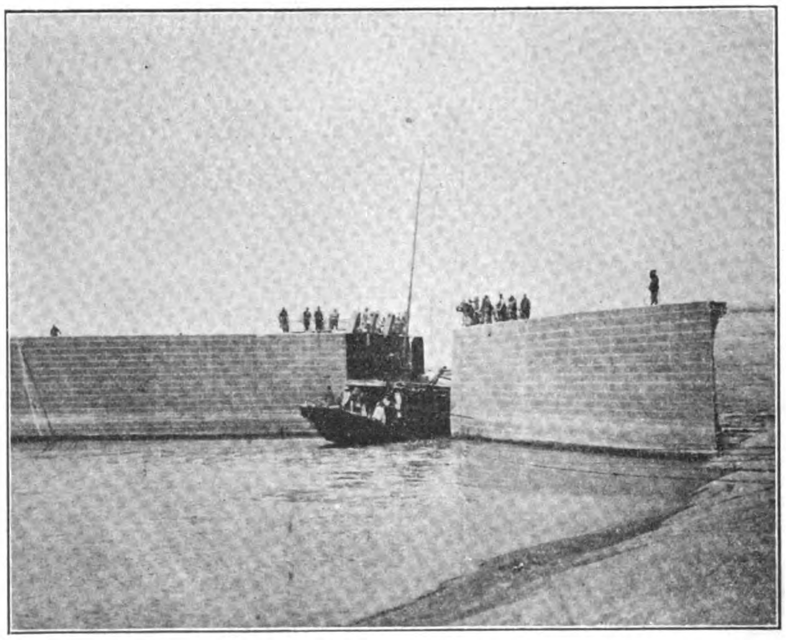


Map No. 3.—Sketch Map of North East China, showing the alluvial plain and the Grand Canal extending 800 miles through it from Hangchow to Tientsin. The unshaded land area lies mostly less than 100 feet above sea-level

THE KEYNOTE OF PERMANENT AGRICULTURE

The exhaustion of cultivated fields must always have been the most fundamental, vital, and difficult problem of all civilized people, and it appears clear that such canalization as is illustrated on maps Nos. 1 and 2 may have been primarily initial steps in the reclamation of delta and overflow lands. At any rate, whether deliberately so planned or not, the canalization of the delta and overflow plains of China has been one of the most fundamental and fruitful measures for the convervation of her natural resources that they could have taken, for we are convinced that this oldest nation in the world has thus greatly augmented the extension of its coastal plains, conserving and building out of the waste of erosion wrested from the great streams hundreds of square miles of the richest and most enduring of soils. We have little doubt that were a full and accurate account given of human influence upon the changes in this remarkable region during the last 4,000 years, it would show that these gigantic systems of canalization have been matters of slow, gradual growth, often

Dyke Building. A huge stone is hoisted by means of ropes by a number of men and does effective tamping work



Grand Canal Lock. This lock is one of the outlets of the Hwai River at Tsiang-kiang-pu, the passage way being 23 feet wide

inititated and always profoundly influenced by the labors of the strong, patient, persevering, thoughtful, but ever-silent husbandmen in their efforts to acquire homes and to maintain the productive power of the fields.

Nothing appears more clear than that the greatest material problem which can engage the best thought of China to-day is that of perfecting, extending, and perpetuating the means for controlling her flood waters, for better drainage of her vast areas of low land, and for utilizing the tremendous loads of silt borne by her streams more effectively in fertilizing existing fields and in building and reclaiming new land. With her millions of people needing homes and anxious for work, who have done so much in land building, in reclamation, and in the maintenance of soil fertility, the government should give serious thought to the possibility of putting large numbers of them at work, effectively directed by the best engineering skill.

It must now be entirely practicable, with engineering skill and mechanical appliances, to put the Hwang-ho and other rivers of China subject to overflow, completely under control. With the Hwang-ho confined to its channel, the adjacent lowlands can be better drained by canalization and freed from the accumulating saline deposits which are rendering them sterile. Warping may be resorted to during the flood season to raise the level of adjacent low-lying fields, rendering them at the same time more fertile. Where the river is running above the adjacent plains there is no difficulty in drawing off the turbid water by gravity, under controlled conditions, into diked basins, and even in compelling the river to buttress its own levees.

There is certainly great need and great opportunity for China to make still better and more efficient her already wonderful transportation canals and those devoted to drainage, irrigation, and fertilization.

As we go to press it is announced that a preliminary agreement has been signed by the Minister of Agricultûre and Commerce giving the American Red Cross Society the right, within a year, to arrange for a loan of $20,000,000 U. S. Currency to carry out the Hwai River conservancy scheme. The loan will be floated at five per cent., and will be secured upon the lands to be reclaimed and the benefit from taxes to be levied in the regions protected from flooding, also the navigation taxes on that portion of the Grand Canal within the area.

The agreement includes the right to nominate the engineer-in-chief and the contracting company to execute the works. Mr. C. D. Jameson will probably be the engineer-in-chief and the contractors will be the well-known firm Messrs. J. G. White and Co. of New York.

MR. LAO CHU-CHANG

Mr. Lao Chu-chang, the Managing Director of the Pukow-Sinyangchow Railway, is a native of Yan-Hsiu-Yuan of Shantung. In 1889 he began his education in a military school in Tientsin. Afterwards he made a study of railway construction in a German railway college, from which he graduated in 1894, and entered the service of the Peking-Mukden Railway as an engineering student to assist in the construction of the Dog River Bridge. After the completion of the bridge in 1897 he was transferred to Luan-chow, and was made assistant engineer.

During the Boxer trouble in 1900 Mr. Lao rendered excellent services to the railway, and spared no pains to devise means to protect the line and its properties. While the German and Russian troops were in possession of the line, he was engaged as a mediator between the foreign troops and the Chinese officials.

The important service rendered to the country at that time was recognized by the bestowal of the rank of district magistrate by the Manchu Court through the recommendation of the Director-General and Engineer-in-Chief of the railway, and also by his promotion in 1902 to the post of district engineer at Ching-chow.

In the summer of 1903 several bridges in the section of Ching-chow were destroyed by floods. Under his direction repairs were immediately made and steps were taken to prevent further damage by floods. He personally supervised the work day and night, and as a recognition of his hard work a eulogistic testimonial was presented to him by the Engineer-in-Chief.

In 1905 Mr. Lao took up the post of Engineer-in-Chief of the Chekiang Railway. Though he did not stay long in the service of this railway, yet he undertook very heavy bridge constructional works, which were carried to the entire satisfaction of all concerned.

Mr. Lao then became connected with the southern section of the Tientsin-Pukow Railway, and was given an important post in the Head Office at Nanking. He rendered useful service in dealing with the northern and southern troops during the Revolution in 1911 in the direction of maintaining the neutrality of the railway. As a result of his success Hsu Shih-chang, the then Director-General of the railway, strongly recommended him for recognition.

In the beginning of last year he was called up to Peking by Mr. Shen Yun-pei, the Director-General of the Pukow-Sinyangchow Railway, and was appointed Chinese engineer of the line. It was not until the completion of a survey of the whole line that he was made Managing Director of the railway.

A photograph of Mr. Lao appears on page 310.

TIMBER RESOURCES OF CHINA

All over Northern China, says a recently-issued report on the timber resources and trade of that country, the forests have been destroyed. There exist only a few groves near the churches or tombs, and partly also round the fields. All the same, one cannot say that China is quite devoid of trees. To the south of the River Yangtsze, in the mountain regions, the original forest has been preserved, abounding in rich varieties, chiefly hard woods. What extent of area is occupied by these forests it is impossible to define, for they have never been investigated; but the forests there are not only sufficient to satisfy the requirements of the local population, but they are exploited for the purpose of supplying a considerable portion of North-Eastern China with working wood and fuel, as well as the foreign colonies in China, and some neighbouring countries. Of the botanical composition of the timber plantations of China information is quite lacking, or almost so. Besides the sorts which yield building wood, we can indicate here the growth of timber, which is of great commercial value, such as the varnish tree, the wax palm, the mulberry tree, etc. The richest area in trees is Manchuria, where the most plentiful varieties are the pine, the cedar, the larch, the fir, the yew, the oak, ash, the elm, the walnut, the amaranth, the birch, the lime, etc.

The timber wealth of Northern Mongolia consists of pine, fir, elm, holly oak, walnut and willow. In Eastern Turkestan the chief features in the forest wealth of the land are birch, pine, fir, larch and poplar. But respecting Tibet, it is known that the leading trees are in its south eastern part, and are the pine, fir, cedar, elm, holly and several form of willow. In view of the destruction of timber over great expanses of land and the growing demand for timber goods, which are continuously rising in price in some of the Provinces of China, the systematic cultivation of timber has already been resorted to on a comprehensive scale in parts that have escaped from unsystematic felling. It may be hoped that with a rational organisation of the timber business China may become a great exporting market, as it is difficult to find a place on the face of the earth where the conditions for producing other than acicular trees are so favourable. The foundation of timber cultivation in China is already laid. But meantime the country is in sore need of imported wood.

China's Timber Needs.

The principle areas in China where timber is called for are the centre and north, for there the forest lands have been practically laid bare. The most important requirements in foreign-grown wood consist of various soft kinds, such as Oregon pine, Californian red wood, fir, Japanese and Korean pine, cedar, aspen, lime, poplar, etc. The value of soft wood recently imported was as follows (in lan) :—2,502,819 in 1911, 2,051,592 in 1910, 2,472,c52 in 1909 and 3,404,909 in 1908, chiefly from Japan, Formosa, and from the United Sates of North America; in fact, almost entirely from the countries named. The timber exports valued 14,084 lan, 18,777 lan, 5,428 lan and 17,568 lan in 1911, 1910, 1909 and 1908 respectively. The value (again in lan) of hard wood imported in the series of years quoted was as follows:—1,575,477 in 1911, 1,976,971 in 1910, 1,597,239 in 1909, and 1,563,986 in 1909, and the corresponding exports of hard wood made 48,614 lan in 1911, 48,465 lan in 1910, 7,974 lan in 1909 and 12,860 lan in 1908. Here it may be observed that about half of the hard wood imported into China comes from Japan. Considerable quantities were received from Hongkong, Singapore, Australia and from the Philippine Islands. Russia's share of the business is insignificant.

Importations.

China is an importer of large quantities of sandal wood. The value of such imported in the year 1911 was 930,756 lan. The greater part (seven-eighths) of this comes from Hongkong. Then there is a considerable import movement in sundry timbers, such as pit wood, which last named in 1911 valued 895,585 lan. The importation of furniture and timber goods for making furniture valued 760,610 lan in 1911. European and Asiatic Russia's share in this business is a growing one, and was represented by a value of 58,000 lan in 1911. Manufactured timber goods, independent of furniture and machinery parts, were imported in 1911 to the value of 230,086 lan.

The importation of matches into China is very large, and greatly exceeds in value that of both hard and soft woods as well as various wood products taken separately. The total importation of matches valued 5,303,372 lan in 1901, 5,294,569 lan in 1910, 5,680,676 lan in 1909, and 5,168,520 lan in 1908. The corresponding export figures are hardly worthy of mention. Japan is the largest provider of the matches. The value of wood pulp imported in 1911 was 130,157 lan, chiefly from Great Britain, followed by Sweden, Norway, Germany, etc.

The total of native wood exported including roundwood, poles, posts, hewn beams and sawn wood of all kinds, through open ports, for distribution in the country, or for foreign lands, valued 4,992,675 lan in 1911; the shipments abroad valued 1,845,623 lan. China exports a considerable quantity of firewood and imber manufactures, such as furniture, and particularly bamboo, with manufactures thereof.

INTERNATIONAL INTRIGUES IN CHINESE RAILWAYS

AN ANALYSIS OF BELGIAN AND FRENCH RAILWAY ACTIVITIES IN CHINA, DISCLOSING THE TRIUMPH OF RUSSIAN DIPLOMACY, THE SIDE-TRACKING OF BRITISH DIPLOMACY, THE LOSS OF CHINA'S FREEDOM OF ACTION, AND THE MENACE WHICH OVERHANGS HER

Under the title of the "Growth of Belgian Interests in China," the FAR EASTERN REVIEW, in its issue of August, 1913, drew attention to the fact that the signing of the agreement for the construction of a railway longitudinally through Shansi, with an extension to Chengtu, the capital of Szechuan province, coupled with the previously signed agreement for a railway from Lanchow to the sea, brought "forcibly to notice *the most important development in international enterprize which has taken place in China in recent times.*" That development was the surprising growth of Belgian interests, combined with the possibility of the co-operation therein of Russian finance or diplomacy, or both. We briefly alluded to the significant connection of Russia with the early participation of Belgian financiers in Chinese railway loans, and after citing instances, concluded the article with the suggestion that "The one thing that is certain is that the loan will not be purely Belgian, and the interesting point to China is: How far does Russia financially or politically participate?"

It interests us peculiarly to see that the importance of this unique advance on the part of Belgium escaped the notice of other publicists until January of this year. The Peking correspondents of *The Times* and the *Daily Telegraph* of London were then prompted to a realisation of it by the statement that the Belgians proposed to establish the seaport of the midland trunk line from Lanchow. (in Kansu Province) at the port of Haimenting, on the north bank of the Yangtsze River, some fifty or sixty miles from Shanghai, instead of at Haichow, as originally suggested—a possibility which was emphasised in the April, 1913, issue of the FAR EASTERN REVIEW.

The correspondent of *The Times* discovered the possibilities of a portentous design on the part of Russia as a result of realisation that British preserves in the Yangtsze bade fair to be trespassed upon, and since his telegram further opens up one of the largest questions which has yet entered the polemical sphere connected with international railway activity in China we reproduce it with the object of using it as the peg upon which to hang argument which it is competent to use to demonstrate the union of purpose and interests which deduction can prove to exist between Belgium, France and Russia in their railway policies in China. *The Times* correspondent says:—

"The belief is current that the Chinese are about to consent to an important alteration in the alignment of the Belgian trunk railway between Lanchowfu and Haichow. Haichow proving on examination unsuitable as a port the Chinese are being pressed to agree to allow the railway, after crossing the Tientsin-Pukow line near the Shantung border, to run southward along Kiangsu province to Haimenting, on the northern bank of the Yangtsze, a small port within fifty miles of Shanghai.

"The change involves the construction of a line parallel to the British section of the Tientsin-Pukow railway, calculated to affect the traffic of the latter. This aspect of the question, however, is of minor importance compared with the prospect of the establishment of the terminus of what must eventually be the longest railway in China at a new port actually on the Yangtsze within a stone's throw of the greatest emporium for British trade in the Far East. So definite a challenge of the British position in the Yangtsze, following on the recent intrusion of French enterprize at Pukow, provokes lively comment here.

"If the Lanchowfu-Haichow railway were a purely Belgian concern less importance might be attached to the present move. But it is well-known that Belgian enterprize in China is largely financed by the French while in some quarters it is believed to be supported politically and financially by Russia. The Lanchowfu-Haichow railway realises a part of a long cherished Russian scheme to build a railway from Russian Turkestan, through Chinese Turkestan, to Lanchowfu and thence into the heart of China. Should such a line ever be built it will be purely Russian at its western extremity and by reason of Russia's relations with France is liable to become subject throughout to the control of Russia.

"The French are now demanding from the Chinese the sole right to construct a line from Yunnanfu to Chengtu. Significance attaches to this scheme because it involves the linking up of the French Yunnan railway with the other great Belgian project from Chengtu to Tatungfu for which the concession was lately obtained. This Belgian scheme is really mainly French, and suspected to be partly Russian, and will inevitably connect hereafter with a Russian trans-Mongolian railway in the north, thereby creating another tremendous steel road based in Russian territory and potentially Russian throughout its length.

"The somewhat fantastic view that Russia under cover of French and Belgian railway enterprise is preparing to swallow the whole of China does not affect the fact that such enterprise is encroaching on British preserves in the Yangtsze and endeavoring to acquire exclusive rights in Yunnan and Szechuan despite an Anglo-French agreement to share equally in these regions."

The Peking correspondent of the London *Daily Telegraph* (Mr. Putnam Weale) also telegraphically drew attention to the subject in his usual vigorous style, and in the course of a despatch said:—

"In continuation of my yesterday's telegram regarding Russia's protest against China opening to international trade and residence five cities in Inner Mongolia, the semi-official press to-day makes the significant announcement that the Sino-French Industrial Bank has finally accepted as security for its £6,000,000 loan, the signature of which was long ago reported, the Peking city octroi receipts. The bonds will consequently be offered for subscription in Paris and London at the end of February. The bank is paying money to the Chinese Government in half million sterling monthly instalments.

"This means another nail in the coffin enclosing Britain's lost prestige in China. Not only has the policy of Sir Edward Grey in attempting to keep up an impossible monopoly disgusted all British enterprise and made English representatives report home the uselessness of their activities, but, in addition, under cover of an embargo on British enterprizes, Franco-Belgian agents have secured the richest prizes. By far the most important is the double trunk railway which the Belgian agents, acting for a Franco-Belgo-Russian combination, secured last summer, and which is now being actively built from the extreme north-western part of China to the Yangtsze estuary, reaching the sea, not at Haichow, as originally scheduled for the purpose of bluffing, but at Haimenting, an anchorage on the north bank of the Yangtsze, 70 miles from Shanghai, which has already been surveyed.

"This is the point at which Russia will ultimately debouch upon the Yellow Sea unless some Power other than England intervenes.

"From Tatung, in Shansi, the present limit of the eastern branch of the Belgian trunk line to autonomous Mongolia is only a few hundred miles, and the entire strength of Russian diplomacy is therefore concentrated on winning from China a demarcation of the independent Mongolian boundary as far south as possible, making the construction of the remaining railway links thereby easier.

"The fact that the French Industrial Bank has virtually acquired the port of Pukow and the right of betterment of Wuchang and Hankow with the proceeds of the present loan shows how much has already been done, whilst the recent demand of the French Minister for a railway concession uniting Yunnanfu and Chengtu forms one of the last links necessary to make complete the chain of a Franco-Belgo-Russian system, enveloping the whole of China and issuing on the sea. . . .

"Since the first shots of the Chinese revolution were fired at Wuchang two and a half years ago British policy may best be described as a series of unmitigated mistakes, principally due to championing the cause of a financial combination which has no right to exclusive support, coupled with the steady discouraging of all who could have saved the situation.

"When one looks back and sees how much has already been deliberately lost and how unpromising is the future, the feeling deepens that some reckoning should be called for by Parliament and that something should be promptly done."

The Times correspondent, unlike his literary confrère, does not express with conviction the view that Russia is the master hand behind the development of Belgian or Franco-Belgian interests in China, though he shows clearly enough that the acquisition of rights by Belgium and France to construct through railway lines which cut China virtually north and south, and east and west stands politically to benefit Russia considerably and to work to the ultimate detriment of Britain. The correspondent of the *Telegraph* is more emphatic. Above all he awakens his people to a sudden realisation of the fact that Russian and French diplomacy has signally triumphed, while that of Great

Britain has been anything but successful, and paves the way for the critical investigator to examine, analyse and assemble evidence to show that there may not be so much fantasy as the *Times* correspondent puts it, in the proposition that Russia is a semi-somnolent partner in the extraordinary railway schemes of Belgium and France as the *Times* correspondent is charitably inclined to suppose.

For the purpose of throwing enlightenment upon a very important question, therefore, we propose to augment the evidence mentioned in the above-quoted telegram, doing so, of course, without prejudice, and in an academic manner.

RUSSSIA'S AIMS IN THE FAR EAST.

It is generally conceded that the great aim of Russia in the Far East has long been, and is, to obtain an ice free port as an outlet for her immense territories in Siberia and Central Asia. Checked in her designs to find a way through Persia to the Persian Gulf, and forced back in her advance on India, she was compelled to seek the outlet at the eastern end of her great empire at Vladivostock. The history of the Siberian railway, and the concession for the Chinese Eastern line through Manchuria is common history, as is also the sequel which gave to Russia the railway from Harbin to Port Arthur and the lease of the Liaotung Peninsula.

The war with Japan, which wrested from Russia the fruits of her diplomatic victory, and compelled her to relinquish the Liaotung Peninsula and the South Manchuria Railway to Japan, and which deprived her of the use of the Chinese Eastern Railway for strategic purposes, compelled her to seek other means to regain her lost position.

Hardly had the ink dried upon the Portsmouth Treaty, than the Russian Government authorized the double-tracking of the Siberian railway and granted the appropriation for the construction of the Amur lines. These works have been actively pushed ahead in the last four years, and the Amur line is nearing completion, while the double tracking of the Siberian railway is about seventy-five per cent. completed. Many other new lines* are projected for the exploitation of Central Asia, some of which have received the sanction of the Government. Vladivostock has been made practically impregnable, but as it lies exposed to Japan it may be wrested from her in another war. As a commercial port, however, it has great disadvantages, for it is open for only half the year and can never serve as an adequate outlet for the great Siberian country and its rapidly expanding trade and industries. Confronted by Japan in South Manchuria, Russia cannot hope to secure a seaport in that direction except through another costly and disastrous war.

In all books dealing with Russian policy in Asia the fact is emphasized that one of her great dreams is an approach to Peking across Mongolia via Kalgan. In the negotiations caused by the signing of the Chinchow-Aigun railway loan agreement, Russia agreed to withdraw her objections to the construction of that line, and suggested that a railway from Kiachkta to Kalgan be built instead. The project for a railway from Kokand (Kojend), the terminus of the Central Asian line, through Kashgar, Hami, Suchow to Lanchow-fu, in China, has always been set aside for Russia to finance and construct, and is looked upon as one of her unquestionable rights.

RUSSIA AND THE PUKOW-HANKOW CONCESSION.

In 1898, during the "Battle of Concessions" for railways in China, the great desire manifested by Russia was to secure control of a railway from the north which would join with a line from Indo-China, and so establish a through trunk route bisecting China, and under control of the Dual Alliance. Only the constant vigilance and prompt measures of the British Government frustrated those designs at that time. The tension was so great that the British and Russian Governments were constrained to enter into an understanding, †which precluded the Russians from seeking railway concessions trespassing upon the Yangtsze valley and Britain from seeking concessions to the north of the Wall.

With this agreement still in force, Russia may not openly take active steps to secure advantages in Central or South China, and can only accomplish her ends through the medium of a third party. This, Russia has apparently done by entrusting her interests to others. She has retired into the background, and confided the active work of advancing her political interests to her political ally and her financial agent.

When the Belgians entered into the field for railway concessions in competition with the great Powers, the suspicions of the Chinese seem to have been lulled by the innocent arguments that Belgium was only a small country with no army or navy, and whose only interest was to find an outlet for her manufacturers of iron and steel products. The Chinese fully believed these statements, even when the real truth was pointed out to them, and despite all warnings sustained their confidence in the honeyed words of the Belgian promoters.

The British Government, however, appears to have entertained no illusions at that time as to the real character of the Belgian syndicates seeking concessions in China, and clearly saw the hand of Russia in the negotiations for the Peking-Hankow line—a railway which would admit Russia into the Yangtsze valley without ostentation. As a matter of fact the most powerful supporter of the Belgian syndicate was the then Russian Chargé d'Affaires (M. Pavloff) in Peking, and the French Minister. The then British Minister at Peking, Sir Claude MacDonald, protested vigorously to the Tsungli Yamen (Office of Foreign Affairs) against conceding the Peking-Hankow line to Belgium because of Russia's participation in the syndicate; and the Tsungli Yamen in reply, assured the British Minister that the Russian Bank was not interested in the scheme, and that no agreement admitting the Russo-Chinese Bank to participation would ever receive the Imperial sanction.

Three days after the Chinese Government gave this assurance the Peking-Hankow Railway Agreement was signed with an ostensible Belgian Syndicate. In Article 18 it was stipulated that the Russo-Chinese Bank would be the Agent for the Bonds, and Article 20 provided that the Russo-Chinese Bank should be the Bank of deposit and the medium for monthly payments.

Here, then, was absolute proof that the Belgian negotiators had either got on the blind side of the Chinese, or that the latter, knowing the facts, had wilfully deceived the British Government.

This breach of faith and slight to Great Britian was costly to China. The British Government immediately demanded compensation for the affront, and insisted upon China granting the concessions for the Shanghai-Hangchow-Ningpo, Shanghai-Nanking, Canton-Kowloon, and Pukow-Sinyang Railways as the penalty for giving the rights to build the Peking-Hankow line to the Belgians with Russian participation.

So here, at the very outset of the struggle for railway concessions in China, Russia employed her Belgian Agent with success to pull the wool over the eyes of the Chinese Government, to bring discredit upon its high officials, and cause her to lose face with Great Britain.

The Peking-Hankow Loan Agreement is usually accepted as a Belgian enterprise by the Chinese and others unacquainted with the true facts, but the French Yellow Book (the official publication of the French Foreign Office) in its issue of June, 1900—where it explicitly enumerates the various railway and mining concessions held by French Companies in China—specifically says that the Peking-Hankow concession is Franco-Belgian, and that the line is built and operated for the mutual profit and equal advantage of the French and Belgian parties. The French participation, according to this official French Government report, is 60 per cent. and the Belgian 40 per cent. So here again is absolute proof from the highest possible source that the so-called Belgian loan and concession was in reality 60 per cent., French.

When it is kept in mind that the Russo-Chinese Bank was the official financial institution of the loan in China, and the Russian Chargé d'Affaires in Peking was the strongest supporter of the syndicate in forcing the loan through, it becomes apparent

*These new projects were fully described in the September, 1912, issue of the FAR EASTERN REVIEW.

†Under date of April 28, 1899, Sir Charles Scott and Count Mouravieff, Russian Minister for Foreign Affairs, exchanged notes wherein Great Britain engaged herself not to seek any railway concessions to the north of the Great Wall, while Russia undertook not to seek railway concessions in the basin of the Yangtsze. Both undertook not to obstruct each other in their respective spheres.

that the Russians also had a fair participation in the syndicate. At all events it is clearly emphasized that the Belgians had acted as the agents of France and Russia in securing the concession, and lulling the suspicions of Great Britain and the Chinese to the true character of the syndicate. It is clear, in view of the facts made public in this case, that the Russian interest in the Peking-Hankow line is deeper than appears on the surface, and that China willingly or unwillingly played into the hands of the Belgians, and had to pay the price for the deception to the British Minister.

SIDELIGHTS FROM OFFICIAL RECORDS

Some interesting sidelights are thrown on the exact status of the Société d'Etudes de Chemins de Fer en Chine, by reference to various official publications of the British and French Governments.

The British Blue Book for 1900, on page 61, reproduces a communication from Sir Charles Scott to the Marquis of Salisbury, dated St. Petersburgh, March 23, 1899, which reads as follows:—

"My Lord,—The Belgian Minister referring yesterday to the recent publication of Parliamentary Papers on Affairs in China, said to me that he understood they contained an interesting account of our opposition to the Belgian concession for the Peking-Hankow Railway, which from what he was told of the correspondence, was based on an entirely mistaken conception of the part which the Russian Government and Russo-Chinese Bank had taken in connection with this concession.

"As he had had to deal with all the communications on the question, he was anxious to give me the most solemn assurance, which the Director of the Russian Bank would be able to confirm, that not a single Rouble of Russian money was invested in that concession, and that the Russo-Chinese Bank had no share or interest in it whatever, except having undertaken to act as Bankers for the Belgian Syndicate. It was a purely Belgian undertaking with the object of developing Belgian industry, and the Russian Government had consented to give the Belgian Government its support in obtaining the concession, for the simple reason that a small country like Belgium could have no possible political object in view, and the Russian Government has said that they could on that account more readily support it than if the undertaking had been German, British or FRENCH."

The British Foreign Office was, however, apparently not entirely satisfied with these assurances, and in the meantime, the prospectus of the Loan was published in Brussels, a copy of which was forwarded to London by the British Minister at Brussels, Sir F. Plunkett.

The prospectus disclosed that the Board of the Société Belge pour l'Etude de Chemins de Fer en Chine was composed half of Belgians and half of Frenchmen, and the two countries would supply each half the employees for the construction of the line, and share the orders in connection with it equally, while of the money lent, 60 per cent. was supplied by the French and 40 per cent. by the Belgians.

Sir F. Plunkett in a communication to Lord Salisbury, dated Brussels, May 6th, 1899, furthermore said:

"My Lord,—The language held by the Belgian Minister at St. Petersburg, reported in Sir Charles Scott's dispatch of the 23rd of March, relating to the Belgian concession for the Peking-Hankow railway (forwarded to me by your Lordship) is identical with that generally held to me here.

"Whenever questioned, the Belgian Government authorities all unite in repeating that the money and interests engaged in that concession are mainly bona fide Belgian, and that the reason why the promoters of this concern had employed the Russo-Chinese Bank was solely because that institution met them in a more friendly spirit than did the English local Banks and commercial magnates, who (they say) sought to exclude the Belgians from participation in the distribution of Chinese Concessions.'

It is thus seen that the Belgian authorities all united to uphold the "bona fide Belgian" character of the Syndicate, and justify the connection with the official Russian Bank. The French Government, however, had nothing to conceal, and in the French Yellow Book (Chine, Juin-Octobre 1900, pp. 23-27) gives the official French version of the status of the Syndicate as follows : "The Société d'Etudes de Chemins de Fer en Chine," a Franco-Belgian syndicate in which the French element is represented by the big financial establishments of Paris and the big metallurgical industries of France, has received a concession of a railway from Peking to Hankow. The two contracts relating to this line, for a loan and for operating, are dated the 26th of June, 1898. The line will have an extension of about 1,250 kilometers. It is being built and will be operated by the Société d'Etudes for the mutual profit and equal advantage of the French and Belgian parties.

"The loan to be floated is 112,500,000 francs. It has been agreed that the French financial share shall be three-fifths, that of Belgium two-fifths. A first issue of 133,000 bonds of 500 francs 5 per cent. was made at Paris and Brussels on April 19, 1899. 226,800 bonds were subscribed for, 190,800 at Paris and 36,000 at Brussels. The product of this first issue will suffice to build 500 kilometers, of which 300 are in the north and 200 in the south, and which will be soon finished. 150 kilometers in the north are already being operated. The building of the remainder will be seen to by a second issue as soon as circumstances permit of it."

It will be noted that although it was arranged that the Belgians should take 40 per cent. of the loan, the French Government officially declares that the proportion of the first instalment of the loan was only taken up as to about 15 per cent. in Brussels, the Paris bankers taking up the balance, or 85 per cent.

After reading Sir Charles Scott's letter to Lord Salisbury the question naturally arises: Why was the Russian Government so willing to support a concession for Belgium rather than openly support what it must have known to be a proposition of its political ally ? The facts disclosed are irrefutable, and the question again arises, if the Syndicate was actually French, why did it select the Russo-Chinese Bank as its agent in China when the business could have been done through the official French institution (the Banque de l'Indo-Chine) ? Did the Russian Government support the syndicate merely for the petty banking profits for the Russo-Chinese Bank on the handling of the funds in China ?

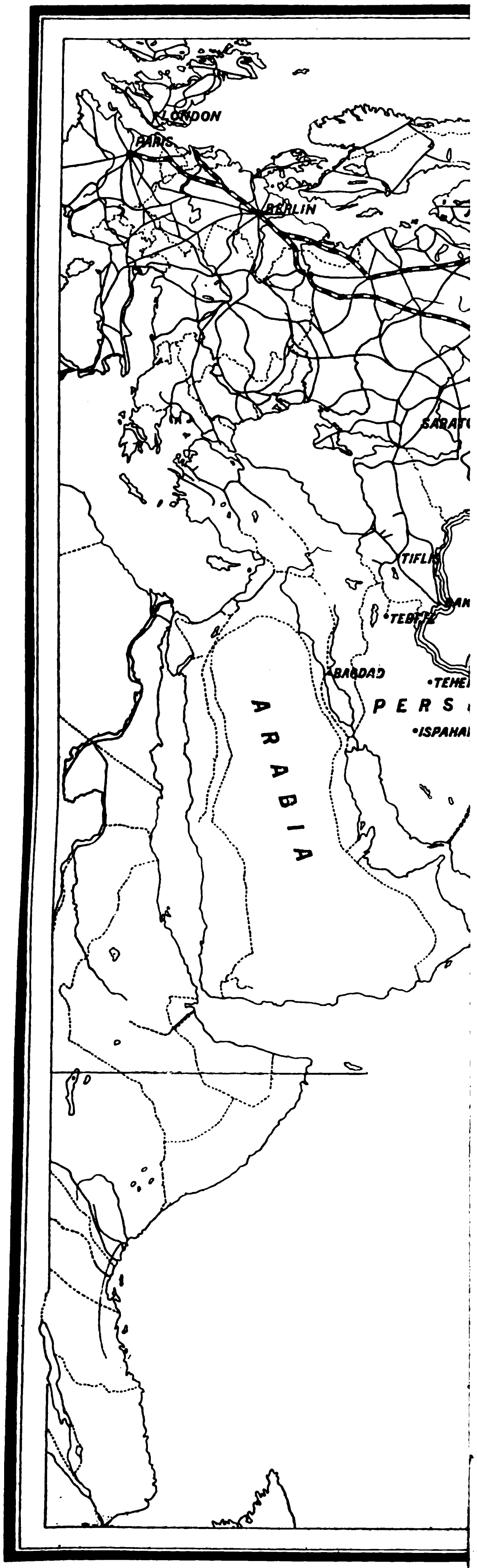
With the above official facts clearly established, and the further fact that the Société Belge pour l'Etude de Chemins de Fer en Chine, is now an integral part of the Official Russian Group, it would appear that the anxiety of the British Government concerning the actual status of the Syndicate had some real foundation.

THE CANTON-HANKOW RAILWAY INTRIGUE

With the control of the Peking-Hankow line securely in the hands of the Franco-Russo-Belgian combination, giving them a line from Peking to the Yangtsze, the allies, intent on their original scheme for a through trunk line dividing China and connecting Russia on the north with her ally in Indo-China, set about to undermine the position of the Americans who at that time held the concession for the line from Canton to Hankow. They had tried hard to secure this concession in competition with the Americans, but had failed, so they then planned to secure control of the American-China Development Company by the open purchase of the shares of the company on the New York stock market. The history of this intrigue and its success is familiar to all interested in Chinese railway history. The Belgian agents quietly purchased the shares on the open market from the unsuspecting American shareholders, and when they had secured control of the stock, they assumed the direction of the company and the work in China. The American engineers were discharged and supplanted by Belgians, and the latter undertook the work of construction of the line.

The Chinese became alarmed as they awoke to the fact that the Belgians had become masters of a dangerous situation, and that the control of the through trunk line from Peking to Canton was liable to fall into the hands of the Russians and their French allies. The Chinese, urged by interested parties, demanded the cancellation of the American concession, and although the firm of J. P. Morgan & Company repurchased the shares to regain the control in the hands of Americans, the Chinese insisted on the cancellation as a penalty for the breach of faith, and America, deferring to the professed desires of the Chinese to construct the line with their own funds, finally assented to hand the concession back to China, in return for $6,500,000, which sum the Chinese borrowed from the Hongkong Government and thus virtually handed over to British interests the rights surrendered by the Americans.

China, at that time made America pay the price for the breach of faith, an error which was not committed with intention, as the shares were bought up on the market privately. But leaving out of the question the feelings of the Americans who had



MAP ILLUS

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been duped by the Belgians and pushed out with the aid of the British, the main object of the latter was achieved, and the Belgians and their Russian partners were blocked in their scheme to secure control of the through trunk line.

China was saved, and the British position was secured in the South Yangtsze region, but the Americans have never forgotten or forgiven the intrigues which made them lose face with China, and which held them up to the ridicule of the financial world. Those on the inside knew that in due time the situation would be repeated, and they have patiently waited to see what attitude China and the other interested parties would assume when the shoe became transferred to the other foot.

Having now clearly demonstrated the designs of the Franco-Russo-Belgian combination which were frustrated in this great scheme we can take up and trace the other ramifications of the general policy of these political and commercial allies. But before pursuing the matter further it may be well to point out that the title of the Franco-Belgian Syndicate who secured the concession for the Peking-Hankow line was the Société d'Etudes de Chemins de Fer en Chine, an organisation which, as will appear later, was in reality the agent for Russian political designs on China.

ACTIVITIES IN WESTERN CHINA

As pointed out in the commencement of this article one of the great dreams of Russia has always been to secure control of the approach to Peking through the Kalgan Pass, and at the time that France secured the concession for the Yunnan line, and subsequently, the French and Russian papers—reflecting the political sentiments of their governments—devoted considerable space to the advisability of securing the concessions for another trunk line through Western China, to connect at Kalgan with the Trans-Mongolian project, to then strike south through Taiyuanfu to Sianfu, and thence to Chengtu and Yunnanfu, where it would link up with the French line to the sea at Haiphong.

Such a line was purely for the advancement of Russia's strategical position in China and Central Asia. It would complete a trunk line bisecting China to the west, away from the coast and the interference of other Powers; would bring the northwest and western provinces within the Russian sphere of influence, and, when the line connecting with Urga was completed, would constitute a through military line for an army of penetration from both North and South. These lines have appeared in many foreign maps and have been designated as Russian projects, and to those who have studied the railway policies of the various Powers in China, no other construction can be placed on the designing of the lines.

It will be remembered that in 1898 the Russo-Chinese Bank secured the concession for the line from Chengtingfu to Taiyuanfu. The question arises, why did Russia seek a concession in the province of Shansi? The answer may perhaps be found in the verbal agreement given by H.E. Sheng Kung-pao (the then Minister of Communications) to the Russo-Chinese Bank, that if the Bank constructed the line to the satisfaction of the Chinese Government, they would be accorded the right to construct the extension from Taiyuanfu to Sianfu. It is well to bear the fact in mind that the right to construct the extension was promised to the Russo-Chinese Bank.

Shortly after the Russians secured the concession for the Taiyuan line, the Belgians succeeded in signing the agreement for a line from Kaifeng to Honanfu, along the Yellow River. Why did the Belgians set such store upon a short, apparently insignificant line that began nowhere and ended nowhere, and had no outlet to the sea except over the rails of the Peking-Hankow line?

Was it simply to act as a feeder for the main line? That was the impression allowed to prevail. The real answer perhaps may be found in the fact that the Agreement gave them the right to construct the extension to Sianfu.

Was there any coincidence in the fact that both these lines had the same destination? It is competent, in the light of later events, to argue that both these innocent agreements for short unimportant lines followed a well defined and deep laid policy for e control of north-west China.

In the French Yellow Book of 1900, the French Government frankly states that although the concession for the Taiyuan line was secured by the Russo-Chinese Bank, the construction and operat on of the line had been entrusted to the French Group in the Russo-Chinese Bank. The same Book also officially states that the Compagnie Général de Chemins de Fer et de Tramways en Chine, which had secured the Kaifeng-Honan Concession, was in real ty a Franco-Belgian Company, and this indicates the predominance of the French capitalists in the concern. It is a significant fact that after the Taiyuan line was completed, and the Russians had handed over control to the French section of the syndicate, that the petition to the Waiwupu for the privilege of extending the line to Sianfu, as promised by H.E. Sheng, was made by the Belgian Minister at Peking. Here we again have the most convincing evidence of the harmony of interests binding Russia, France, and Belgium.

RUSSIA'S RENEWAL OF ACTIVITIES

At this time, or about four years ago, Russia's prestige had declined in China as a result of the war with Japan, and it was necessary to entrust her interests to her ally and agent until she could resume diplomatic activity in Peking on her own behalf. Russian policy in Asia never changes; it may be checked at times, but Russia quietly awaits her opportunity and at the right moment presses forward and regains her lost ground. Thwarted by Japan and Britain in gaining her ice free port at Dalny, she has had to readjust her position and policy to the changes brought about by the war. Russia must have such a port for the development of her great Asiatic Empire, and, as she has none of her own, she must necessarily take it by force from her neighbor, which, in this case, is China. As she is not yet ready again to try conclusions with Japan and her formidable ally, she has had to attack the problem from the flank and press her borders out at the expense of China, and with the aid of her ally and her agent attempt to gain in China Proper what she has had to relinquish in Manchuria.

The Revolution presented her with the opportunity in Mongolia. The dominance of Mongolia by Russia under the guise of acknowledging the independence of the Mongolians is fresh history. With the loss of her sovereignty over Outer Mongolia, China has to carry on a costly and tedious warfare against the Urga authorities who now claim jurisdiction over all the Mongol tribes, for the final possession of the Inner Strip. Why has Russia forced this issue on China at a time when the Government is struggling to hold the country together and preserve its integrity in the greatest crisis of its history?

The reason is not far to seek. Russia's plans are bearing fruit, and the dissensions and jealousies of the Powers and the Bankers have presented her with an opportunity, which she has profited by, to advance her interests.

THE NOTORIOUS "BELGIAN LOAN"

We must go back to the time of the Revolution and trace briefly the struggles of both sides to secure funds to carry on the war. All the foreign Governments had agreed to maintain neutrality, and through their control of the Quadruple Financial Groups, the four large lending nations had effectively closed the door to any independent loan. Up to this time, Russia and Japan, owing to their being borrowing nations, had not actively entered into the competition to finance China, except in a small way. But the Revolution with its iron bound monopoly of the Quadruple Group opened the way for their activities. Russia's opportunity had arrived.

In November, 1911, there arrived in Peking at a time when the financial deadlock was in force, a new figure in Chinese banking circles, who represented what was claimed to be an independent international syndicate. This gentleman was M. de Vos, who had been promoted from the Belgian Consular service to the head of an exceedingly strong financial group. M. de Vos had been Belgian Consul General at Tientsin and afterwards at Kobe, and when home on a vacation he was selected to head the new "independent" group.

The group was composed of the Russo-Asiatic Bank (previously styled the Russo-Chinese Bank), the Sino-Belgian Bank, Banque d'Outremer, Société Générale de Belgique,

Société Belge d'Etude de Chemins de Fer en Chine, Eastern Bank, Limited, J. Henry Schroeder and Co. and A. Spitzer and Co.

It was a significant fact that although the Russo-Asiatic Bank had its own branch and capable financial agent in Peking, the leadership in the new group, in which the Bank was included, was entrusted to a Belgian Consular official. This naturally gave rise to the impression that M. de Vos was in reality a special agent sent to China to work in harmony with the Bank for railway and other concessions and Government business, which the bank itself was prohibited from undertaking owing to the convention with Great Britain defining the Russian sphere as practically north of the Great Wall. Otherwise why should such a group be organized, with the Russian Bank in the leading role, and its negotiations be entrusted to a Belgian Consular official with no previous training as a financier? The work of M. de Vos since he arrived in Peking has, in the mind of critics, fully confirmed the above surmises.

After successfully negotiating a few minor financial transactions he was ready for the real work he was undoubtedly sent to do. The then Premier was badly in need of funds for administrative purposes, and the only available asset left to offer as security for the tottering Manchu Government was the Kalgan railway. The then Acting Minister of Finance had tried to secure a loan for £1,000,000, on the security of the Kalgan line from America. Although this sum represented the entire cost of the line, American bankers would not listen to such a proposition. But the representations of their agent in Peking convinced them that the line was a valuable one, and that the Chinese would only concede this loan to America for fear of its falling into the hands of Russia if the loan were raised in Europe. The American bankers were willing to advance the funds, but were prohibited from so doing by the command of the American Government, who refused to permit the neutrality agreed upon by the Powers to be broken. The American bankers were consequently compelled to retire, but still endeavored to maintain a footing for this loan. The Americans were specially urged by the Chinese to take up the loan on the grounds that it was an established policy of the Chinese Government never to permit the Kalgan line to fall under the influence of any European Power, for fear that Russia might be interested and so secure the control of the much-coveted approach to Peking. Only to America, it was then declared, would the Chinese consent to mortgage this line, and the Americans interested believed the specious and logical arguments adduced, and were prepared to lend the money as soon as the embargo on independent loans was raised by the Powers.

When Yuan Shih-kai was proclaimed provisional President of the Republic and Tang Shao-yi was appointed Premier, one of their first acts was to enter into an agreement with the Quadruple Group for the immediate financing of the country, giving them an exclusive option on all loans. This agreement was in the shape of a letter* signed on March 10, 1912, but the first act of the new Government after that date was to sign a loan for £1,000,000 with the Belgian Group, headed by M. de Vos, giving the Kalgan line as security. The new Government knew that the Americans stood ready to advance this sum, but they deliberately signed the loan and therewith handed over the Kalgan railway as security, forgetful perhaps of the policy of the previous Government in this regard, and ignorant, no doubt, of the close connection of the Belgians with the Russians.

So once again the Belgians scored, and once again the Chinese had to pay dearly for the breach of faith with the Quadruple Group, and incidentally caused the world to lose confidence in the integrity of their most brilliant diplomatic official. If it had not been for the vigorous protest of the Powers, which compelled this "Belgian" loan to be covered by the Reorganisation loan, the Kalgan line would now be effectively mortgaged to Russia under the flimsy disguise of a Belgian loan.

RUSSIA IN THE SEXTUPLE GROUP

When the time came for the negotiation of the Reorganisation Loan, Russia and Japan demanded and received admission into the official Quadruple Financial Group, which then became known as the Sextuple Group. The new combination arrived at a mutual agreement amongst themselves as to the division of future business in China, and the names of all the Banks constituting the various Groups were then set forth in that document.* The Russian Bank signed the Inter Group Agreement, acting for the following parties, known as the Russian Group. These names should be carefully noted, as they fully corroborate the fact that the Belgians are in reality acting in China on behalf of Russia, and that M. de Vos, in his capacity as the head of a Belgian syndicate, must likewise be regarded as an agent of Russia, although engaged professionally as a Belgian financier. The names of the Russian Group are:

BANQUE RUSSO-ASIATIQUE
A. SPITZER & COMPANY
J. HENRY SCHROEDER & COMPANY
EASTERN BANK, LIMITED
BANQUE SINO-BELGE
SOCIÉTÉ BELGE d'ETUDE DE CHEMINS DE FER EN CHINE
SOCIÉTÉ GÉNÉRALE DE BELGIQUE
BANQUE D'OUTREMER (BELGIAN)

Or, in other words, this is the identical Group for which M. de Vos had been acting up to the time the Russians were admitted into the Sextuple Group. With the above names before us, it is well to stop and analyze the composition of the Group before proceeding further.

The Peking-Hankow Railway Concession was signed by the Belgians in the name of the Société Belge d'Etude de Chemins de Fer en Chine, which, according to the French Government Yellow Book of 1900, was a Franco-Belgian syndicate, in which the Belgian share was only 40 per cent. We have seen that the Russo-Chinese Bank (now Russo-Asiatic Bank) was the official Bank in China for the service of the loan during construction, and we now find the suspicions of 1898 openly confirmed, and the Société Belge d'Etude de Chemins de Fer en Chine, is unblushingly a component part of the official Russian Group at the actual moment. This amply proves the part played in 1898 and discloses the real character of the concern.

The Kaifeng-Honan Railway Concession was signed in 1899 in favor of a so-called Belgian syndicate called the Compagnie Générale de Chemins de Fer et de Tramways en Chine. The French Yellow Book for 1900, however, describes this as a Franco-Belgian syndicate, indicating that the French element predominated, and although the actual proportions of the shares are not given it is fair to assume that it was at least half, if not similar to the other concession in which the Belgian interest was officially only 40 per cent., which included the Russian share.

FROM RUSSIA TO THE SEA.

It is a remarkable and significant coincidence that M. de Vos, quietly working in Peking for the advancement of purely Belgian interests, though at the head of what was afterwards admitted as the official Russian Group, should secure the concession for the extension of the Kaifeng-Honan railway on behalf of the Cie Générale de Chemins de Fer et de Tramways en Chine. The original concession only gave the company the right to the extension westwards from Honan to Sianfu, but we find, in the actual loan agreement,† that he not only succeeded in having this extended to Lanchowfu, but also obtained the right for a futher extension to Suchow-fu, while to the eastwards the line was continued from Kaifeng to the sea at Haichow.

A little reflection and study of the map should convince one that this is an essentially Russian project, and dovetails into the Great Trans-Asian line which has always been set aside for Russia. As the continuation westwards from Suchowfu must necessarily ultimately connect with Russia's Central Asian system, and constitute a through trunk line from Central Asia to the heart of China and the seacoast, it must have met with the hearty support of Russia.

*See "Revolution Number" of the FAR EASTERN REVIEW, April, 1912.

*See FAR EASTERN REVIEW, March, 1913, for full text of the Inter-Group Agreement.

†See full text of Agreement in the January, 1913, issue of the FAR EASTERN REVIEW.

If Russia denied the right of China to construct the Chinchow-Aigun line under American financiers and British contractors, as constituting a menace to her strategical position on the Amur, would she not have prevented the construction of the line to Lanchow and Suchow if the agreement had been made with any country other than her aily or her agent? That is a fair question.

Everything points to the conclusion that this line was secured by M. de Vos in furtherance of Russia's special interests for the penetration of China from Central Asia, and to give to Russia, when the time comes, the right to a port on the coast of China.

The acquirement by alleged purely Belgian interests of the right to build this railway was one of the greatest victories achieved by Russia under the nose of her opponents, and in the future will have a far reaching effect upon the destinies of China and the position of Great Britain in the Yangtsze valley.

Always bearing in mind the desires of Russia for an ice free port, we can now follow more intelligently the course of events since the loan agreement was quietly signed. The ostensible terminus of the line was placed at Haichow, a small port south of Shantung. Every skipper on the China coast knows that a port can only be created at Haichow with the initial expenditure and continuous outlay of huge sums of money, and for all practical purposes it is worthless. But Russia or her agent could not openly seek an outlet into the Yangtsze without incurring the displeasure of Great Britain, so the terminus was quietly left at Haichow, and meanwhile work was commenced and surveys made on the line itself.

HOW THE YANGTSZE WAS REACHED

We must now divert and turn to another phase of the situation to elucidate how the difficulty of the port was quietly overcome. Some years ago the concession for a line from Tsingkiangpu, on the Grand Canal, to Tungchow, at the mouth of the Yangtsze River, was granted by the Central Government to a provincial concern known as the Kiangsu Railway Company, and only a few miles of poorly constructed line had been built out of Tsingkiangpu when the funds were exhausted. All work was consequently stopped and an attempt was made to secure further capital either from the Government or by a foreign loan.

On January 15, 1913, the representative of the Kiangsu Railway Company entered into an agreement with a continental financial agent for a loan of £1,250,000 for the construction and equipment of a line from Tungchow to Tsingkiangpu. The loan agreement was countersigned by the then Minister of Communications, and thus a Government loan, without supervision, was granted for the benefit of a purely private railway. The issue price in the loan agreement was stipulated at 93, but as the financial agent had emphatically stated that he could not give more than 90, it was arranged and provided for in another clause that the difference between the real and fictitious price would be paid back to the Bankers who might take up the loan as a lump sum payment for their services in supervising the construction and equipment of the line. Needless to say no reputable Banker could be found who was ready to sacrifice his reputation by becoming a party to such a palpable attempt to deceive the Chinese public as to the real issue price, and as a consequence the loan could not be negotiated in Europe.

When it was realized that this loan was impossible and that the port of Haichow could not serve as the terminus of a through trunk line, according to Chinese reports, it was quietly arranged to change the terminus of the line to near Tungchow. The Tsingkiangpu-Tungchow line, controlled by the Kiangsu Railway Company, was nationalized, and it was then incorporated as a part of the Lung-Tsung-U-Hai line.

The result of this manœuvre is that the Belgians have quietly secured a through line from Central Asia to the mouth of the Yangtsze River, with a good port which can be developed to accommodate ocean-going steamers.

The British Government was asleep, China was hypnotized, and now they awaken again to find that another clever move has been made and that Belgium has secured for her ally the great object of her dreams, an outlet to a deep warm water port on the Pacific, and one may be excused for conjuring in one's mind a picture of the not distant future when the Russian Bear will be squatting on the north bank of the Yangtsze, near Tungchow, grinning at the discomfited Lion on the other bank at Shanghai, or Woosung, its port, while Chanticleer will crow from any and every eminence available.

THE HWAI RIVER CONSERVANCY LOAN.*

While on the subject of the terminus near Tungchow and the railway to Tsingkiangpu, we may as well devote a few thoughts to another important phase of the situation which has recently arisen in connection with this district. It is well known that the American Red Cross Society, in its great desire to assist China to preserve the lives of the millions of people whose homes are periodically swept away by the floods in the Hwai River District, sent an American engineer to survey and make a report on the best way to prevent such catastrophes in the future.

It is now common knowledge that certain interested Chinese do not want the Americans in the Hwai River district, and rather than accept the aid of the American Red Cross, they would prefer to float a loan for the proposed conservancy works with the Belgians, with whom negotiations have proceeded. As the loan will probably be for £4,000,000, and be secured on the land tax of the district as well as the reclaimed lands, this should give food for thought. Why do these Chinese desire that the Belgians should take up this loan in a district through which their great trunk line passes, and which if effected will give the Belgians or Russians a mortgage on the lands?

If the interest on an American loan should ever be defaulted, and it became necessary for the bankers to take possession, the Americans would only do so as a last resort and then only to secure their interest. But if the loan for this conservancy work were entrusted to the Belgians, who are officially a part of the Russian Group, and who hold the mortgage also on the great trunk line through the heart of the district, and control a port near Tungchow, what would occur if it became necessary to foreclose and take over and administer the security?

Would Russia ever recede from the position?

It begins to look as though the Chinese concerned have also been hypnotised by the Belgians, and that they are unconsciously being led to betray the best interests of their country. The Americans have proposed the Hwai River Conservancy work, and the loan to carry it through, as a purely humanitarian measure, for on the face of it there is no profit to them in such work other than the satisfaction of saving the lives of millions of people and reclaiming to prosperity a large district of China. In view of this, and by virtue of the claims they have to the enterprise as a result of the enormous amount of charity they have lavished on the district in the past it is quite possible that Americans will secure the work, and that at least one plan of the Belgians will miscarry.

BELGIAN REPRESENTATION IN PEKING.

When the Lung-Tsing-U-Hai Loan Agreement was signed by M. de Vos, on behalf of the Cie Générale de Chemins de Fer et de Tramways en Chine, he was particular to state in the agreement that the syndicate was domiciled in Brussells. But there is the evidence of the French Yellow Book that the company is controlled in Paris, and we know that at the time the document was signed, M. de Vos was the head of the Belgian syndicate in the official Russian Group. When the Russians were admitted into the Sextuple Group, and the Agent of the Russo-Asiatic Bank in Peking assumed the leadership of his national organization, the old concern appointed M. de Vos as the representative in Peking of the Sino-Belgian Bank, a subsidiary of the great Société Générale de Belgique.

During the negotiations for the Lung-Tsing-U-Hai railway loan M. de Vos received the active support and assistance of the Belgian Consul-General at Tientsin, M. Disiere, and it is significant that after the loan was signed, the Belgian syndicate, again following the example already created, selected him for the important position of its representative in China, and M. Desiere

* Since this article was written it has been announced that a loan to carry out the Hwai River Conservancy work, has been arranged between China and the American Red Cross Society. Particulars are given elsewhere.

now has his office with M. de Vos in the Sino-Belgian Bank, Peking. Of course this precedent had been set by other countries, who had elevated men from the consular and diplomatic service to represent their national financial institutions in China, as witnessed in the case of Mr. S. F. Mayers, formerly of the British Legation, and now head of the British and Chinese Corporation; Mr. Willard Straight, who left the American Consular service to serve his country through the management of the American Group; Herr Cordes, a graduate from the German Consular service, and others. The fact remains, however, that these men were selected for their special knowledge of the political situation in China and their intimacy with the officials rather than for their previous experience as financiers.

THE TATUNG-CHENGTU LINE

M. de Vos did not rest with his success in the Lung-Tsing-U-Hai loan. His work was only half completed and he had still to secure another line, which would obviously be the other great link for the furtherance of Russia's original dream. He had to work quickly and quietly as President Yuan Shih-kai had confided to Dr. Sun Yat-sen the right to finance and construct the future railways of China. But M. de Vos never consulted Dr. Sun at Shanghai. He remained at Peking and kept quietly at work negotiating with the Peking authorities, whom he knew and understood. The result was that on the 4th of August, last year, he was able to cable to Europe that he had at last secured the concession for the line from Tatungfu, in Shansi, near the Mongolian frontier, through Sianfu to Chengtu, the capital of the province of Szechuan. The Ta-Cheng line the Chinese have called it. It means in Chinese the "Great Achievement," a phrase possessed of considerable irony when regarded from the Russian point of view.

The "Great Achievement" was signed by M. de Vos on behalf of the Société Générale de Belgique, the important Belgian financial institution which is allied with the greater Société Générale of Paris There can be no doubt of its financial strength, and its position as the leading Belgian Bank, but when we again scan the names of the Banks composing the Official Russian Group, we find the name of the Société Générale de Belgique, with its subsidiaries the Sino-Belgian Bank and the Banque d'Outremer.

If the Société Générale de Belgique is a purely Belgian enterprise, what is its name doing in the Official Russian Group? It is well known that the Société Générale de Paris is largely interested in the Belgian concern of the same name, and if their interest is in the same proportion as similar combinations, and if the Russians have also a share in the loan, it would appear that the legitimate Belgian interest in the "Great Achievement" is again not what we are led to suppose.

The Chinese, perforce, were elated in the belief that they had outwitted the official Banks and brought about the crowning consummation to years of struggle against the financial monopoly. They have secured more and more liberal terms from the Belgians, and the Managing Directors appointed under the loan agreements have absolute power. They can construct the lines almost as they wish. The Belgians, it seems, have been unable to find a proper Engineer-in-Chief for the Lung-Tsing-U-Hai line and the work is progressing under the direction of assistants appointed by the Managing Director. They have brought about the "Great Achievement," and for a time they feel well satisfied with their work.

But the day of reckoning will come. It is coming. And the Chinese officials now in power are beginning to see it. The hand of Russia is as unmistakably shown in the Tatung-Chengtu Agreement, as it is in the absorption of Mongolia and the present struggle for the control of the Inner Strip.

As China is gradually forced to concede Inner Mongolia to the warlike tribes from the North, and the Inner territory comes under the influence of the so-called independent Mongolian Government, Russia will be seen reaching out to reap the reward of her diplomacy, and the Cossack will pace the Great Wall of China as the outpost of her new frontier.

In the hope of doing something to stave off this calamity, which the present rulers of China appear now to recognise as impending, a Presidential Mandate was issued on January 8 throwing Kalgan, Kweihwachang, Dolonor, Chihfeng, Taonanfu and Lungkow open to foreign trade. It is almost a forlorn hope that the merchants of other nations will be attracted there in sufficient numbers to offset the march southwards of Russia. Russia will persevere, and when the time comes, and the long talked of line from Urga to Kalgan or Kweihwacheng is finally built, Russia will find a ready-made connecting link with Peking via Kalgan and across western China from Tatung, whereby she may join hands with her ally in Yunnan; and no Power or combination of Powers in the world can say them nay.

INTERNATIONALISATION OF THE YANGTSZE VALLEY

Aims of the British Government and Interests of British Manufacturers defeated by the Official Organisation

In the preceding columns the unfolding of Russia's designs on China through the agency of the Belgian element in the Russian Financial Group, was fully described. Only one more link now remained to be forged to realize the great dream of Russia for a through trunk line from the North of China to the South in Indo-China. The French railway from Haiphong, the French port of Indo-China, now terminates at Yunnanfu, the capital of the rich Province of Yunnan, and the right to bridge a gap of a few hundred miles between Yunnanfu and Chungking, or Chengtu, the capital of Szechuan, had alone to be secured to permit plans being made for the final consummation of the magnificent scheme. Russia was debarred from openly competing because of her understanding with Britain in the Scott-Muravieff treaty, and Belgium had already done all that she could safely do without arousing suspicion, so the task of completing the scheme of the Allies now devolved upon France, with her powerful financial and political prestige to insure success.

To appreciate fully the actual situation, we must again return to 1898 during the fierce "Battle of Concessions" waged for the control of China through the medium of railways. Great Britain's open policy was to obtain control of the great Yangtsze Valley and the trade routes converging on Hongkong by the way of Canton. To secure this advantage the British obtained from China the concessions for the short lines radiating from Shanghai and Canton, and cemented their hold upon these sections. The Shanghai-Nanking and Tientsin-Yangtsze (Pukow) and Canton-Kowloon concessions were thus secured for British interests. The latter furthermore hoped to control the Yangtsze Valley by railways from Shanghai being continued to envelop the valley to the westward through the principal cities and towns along the northern and southern limits. The idea was thus conceived of extending the Shanghai-Nanking line westwards from Nanking, or rather from Pukow, on the opposite bank of the Yangtsze river, to an indefinite point on the line of the then projected Peking-Hankow railway at Sinyang, thus enclosing the northern half of the valley, while it was hoped to proceed from Shanghai, by way of Hangchow, westwards to Nanchang and Changsha, to encircle the southern portion. The scheme provided for the ultimate extension of the northern—Pukow-Sinyang—line westwards to Chengtu, the capital of the immensely rich and populous province of Szechuan.

The opportunity for demanding these last two concessions soon presented itself. As already referred to, Great Britain's interests demanded that Russia should not invade the Yangtsze Valley, and at all hazards she should defeat any project which would supply the means for Russia on the North to make a union by a line from Peking with her ally on the South. Russia was striving hard through her Belgian agents to obtain control of such a trunk railway, while the British Government was as zealously doing its utmost to defeat the scheme, but, as noted, the Belgians gained the day. The Chinese were hoodwinked and the contract for the Peking-Hankow line went to Belgium after a solemn assurance from the Chinese Government to the then British Minister that no concession admitting Russian participation would receive the Imperial sanction.

The British Government demanded immediate compensation for the slight and affront to its dignity, and China had to

concede the rights for the Shanghai-Hangchow-Ningpo and the Pukow-Sinyang Railways as the penalty.

BIRTH OF THE BRITISH AND CHINESE CORPORATION, LTD.

As a direct result of the situation arising from the keen struggle for railway concessions in 1898 to strengthen the political hold of the European Powers on China, the organization of a purely British company became essential to act as the official instrument for the execution of the concessions extracted from the Chinese Government. Previous to 1898 no serious attempt had been made by the European Powers to secure railway or industrial concessions in China as purely national undertakings in pursuit of political designs, but the unblushing sale of the country's rights to Russia by Li Hung-chang, compelled the other nations to enter the field to protect their own interests.

The leading British financial institution in China (The Hongkong and Shanghai Banking Corporation), having on its Board of Directors the principal partners of the great German trading firms, had up to this time been operating under an agreement* with the official German Banking Syndicate for mutual participation in administrative and railway loans to China. With the sudden change in the situation caused by the Russian advance, and the creation of the "spheres of influence," combined with the keen struggle for railway concessions to develop and strengthen the special interests of the various Powers in their respective spheres, came the urgent demand for the organization of purely national institutions to execute the concessions and maintain the national commercial supremacy in the respective spheres.

The Hongkong and Shanghai Banking Corporation foreseeing the great advantages and profits to be derived as the representative British organization for the railway development of British policy, terminated their working arrangement with the strong official German Syndicate, and on April 4th, 1898, addressed a note† to the British Foreign Office to the following effect:—

31 Lombard Street, London, April 4, 1898.

SIR:—

I have the honour to acquaint you that the arrangement under which this bank hitherto worked with the German Syndicate for the construction of railways in China has been terminated by mutual consent. It is now agreed that the German Syndicate and ourselves shall each work separately.

I may here mention that the German Syndicate, always a powerful combination, has of late consolidated its position very much, and now includes all houses of any importance in Germany. It also enjoys the confidence of and receives the support of the German Government.

In order that British interests may be fully represented, and that we shall be in a better position to cope with the powerful combination now opposed to us in China, the bank has decided to form a strong representative and influential syndicate to deal with the railway construction in China.

The proposed line between Shanghai, Soochow and Nanking will, in the first place, engage our special attention. The line will run through one of the richest and most populous districts in China. It will help to open up the country, and as the line is sure to prove remunerative, it will also stimulate similar enterprises in other directions greatly to the advantage of British trade.

As it is of the utmost importance that the Shanghai-Nanking line should be secured by England, I at once arranged with the well known house, Messrs. Jardine, Matheson & Co., China, who had already been approached by the Chinese on the subject, to enter into negotiations on behalf of the proposed British Syndicate for the construction of the railway.

The formation of our Syndicate will occupy a little time, but immediately after Easter I hope to have the honour of submitting to you the names of the members composing the Syndicate and all other details, which I think will satisfy you as to the representative nature of the combination.

In the meantime, I trust the explanation I have given will warrant you in giving the necessary instructions to Sir Claude MacDonald to give Messrs. Jardine, Matheson & Co. and the bank such support as they may require.

I have, etc.

(Signed) EWEN CAMERON.

THE CLAIM FOR OFFICIAL HONORS.

It is clearly evident from the above communication, that the Hongkong and Shanghai Banking Corporation, and the commercial concern of Jardine, Matheson & Co., combined to organize the representative British Corporation, and solicited the support of the British Government on the strength of its purely British character. As the first step to assuring this official support, the Bank was compelled to terminate its working arrangement with the official German Syndicate, to enable it to enter the field free from an alliance which would have been instantly challenged by other legitimate British concerns.

The British Government, as a result of the above assurances, evidently gave its undivided support to the proposed Corporation as the exculsive financial instrument for the execution of all railway and other concessions extracted from China under diplomatic pressure. The main fact that is clearly established by the above letter, is that the British Corporation was compelled to free itself from its association from the official German Syndicate, before it could consistently assume the responsible position as the trustee for British interests. In view of the subsequent actions of the British Corporation once it had the monopoly of support from its Government, it is curious to understand how any distinction was made as between an alliance with the official German Group and the official French Group.

The severance of relations with the official German Syndicate to secure the official recognition, and the subsequent alliance with the French and Belgians with the full knowledge and support of the British Government, can only be construed as deliberate to eliminate Germans from any association in the construction of railways in China. But something of what was refused to Germany was cordially handed over to France and Belgium, as will be seen later.

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*BRITISH AND GERMAN AGREEMENT RE RAILWAY CONSTRUCTION IN CHINA.—Minutes of Meeting held at New Court, St. Swithen's Lane, London, on the 1st and 2nd September, 1898.

Present:—Representing the German Syndicate—M.A. von Hansemann. Representing the British and Chinese Corporation, Ltd.—Mr. W. Keswick. Representing the Hongkong and Shanghai Banking Corporation—Mr. Ewen Cameron, Mr. Julius Brussel.

M. VON HANSEMANN proposed the following:—"It is desirable for the British and German Governments to agree about the sphere of interest of the two countries regarding the railway constructions in China, and to mutually support the interest of either country." This proposal was agreed to.

The following proposal of M. von Hansemann regarding the British and German spheres of interest for applications for Railway Concessions in China, viz.

"1.—British sphere of interest, viz.—The Yangtsze Valley, subject to the connection of the Shantung lines to the Yangtsze at Chinkiang; the provinces south of the Yangtsze; the province of Shansi with connection to the Peking-Hankow line at a point south of Chenting and a connecting line to the Yangtsze Valley, crossing the Hoangho Valley.

"2—German sphere of interest, viz.—"The province of Shantung and the Hoangho Valley with connection to Tientsin and Chengting, or other point of the Peking-Hankow line, in the south with connection to the Yangtsze at Chinkiang or Nanking. The Hoangho Valley is understood to be subject to the connecting lines in Shansi forming part of the British sphere of interest, and to the connecting line to the Yangtsze Valley, also belonging to the said sphere of interest."

Was agreed to with the following alterations, viz.—"The line from Tientsin to Tsinan, or another point of the northern frontier of the Province of Shantung, and the line from the southern point of the province of Shantung to Chinkiang to be constructed by the Anglo-German Syndicate (meaning the German Syndicate on the one part, and the Hongkong and Shanghai Banking Corporation and the British and Chinese Corporation, Limited, on the other part, in the following manner, viz.—

"1—The capital for both lines to be raised jointly.

"2—The line from Tientsin or to Tsinan or another point on the northern frontier of the Province of Shantung to be built and equipped and worked by the German group.

"3—The line from the southern point of the province of Shantung to Chinkiang to be built and equipped and worked by the English Group.

"4—On completion the lines to be worked for joint account.' So far the minutes of the proceedings of the meetings, and it is further agreed upon that neither the German Group nor the English Group will be bound to construct the lines assigned to their sphere unless the Shantung lines be constructed simultaneously.

Signed London, September 2, 1898.

Approved of and signed by A. VON HANSEMANN, W. KESWICK, EWEN CAMERON, JULIUS BRUSSEL.

†British Blue Book; China (1), 1899, page 4.—Hongkong and Shanghai Banking Corporation to Foreign Office. (Received April 4th, 1898)

The result of the letter of the Manager of the Hongkong and Shanghai Banking Corporation to the Foreign Office was the early organization of the British and Chinese Corporation, Ltd.,* and to this new combination was entrusted the honour of safeguarding and protecting the interests of Great Britain and of securing to British manufacturers the tangible fruits of the Government's diplomatic victories.

The organization being a purely commercial one, and as neither the Bank nor the Commercial firm had any previous experience in railway construction, the usual official departmental system of construction was adopted, as by that means the Corporation could derive a legitimate and continuous profit by acting as the Purchasing Agents in connection with the loans for all materials purchased abroad. Like its prototype, the Crown Agents for the Colonies, in England, it confined its activities to appointing engineers to build the lines, and to supervising the purchase and shipment of materials.

SQUEEZING OUT INDEPENDENT INTERESTS.

With all the concessions secured from China through the pressure of the British Government duly handed over to its charge for execution, the British and Chinese Corporation thus became the official railway organization of its Government in China. With full confidence in its ability to build the lines creditably, and with absolute faith in its patriotism and loyalty to British interests, the British Government extended to the new combination a monopoly of its official support, and discouraged all competition by other responsible British railway builders.

From time to time other British railway constructors endeavored to secure a footing in China, but were compelled to retire after severe financial losses, and leave the field to the undisputed control of the official commercial organisation. Although reputable British contractors, who have successfully constructed thousands of miles of railways in other parts of the world, have at various times offered to build railways for the Chinese Government at lump sum contract prices 25 to 33% under the prevailing costs of departmentally built lines, they have been systematically opposed and driven from the field. The Chinese Government, who had to pay the bills, and who would have profited by having its railways constructed more economically and expeditiously, was forced to sit still and meekly acquiesce in the system. The British and Chinese Corporation, however, once it secured the official concessions, commenced to consolidate its hold on the railway field in China and to eliminate all competition.

Notwithstanding the fact that these railway concessions were given to the British Government as purely British lines, and that the British Government entrusted its national interests to the British and Chinese Corporation, it is on record that on February 1, 1899, the Corporation entered into an agreement† with the American-China Development Company, who, at that time, held the concession for the construction for the Canton-Hankow railway, in which the British and Chinese Corporation agreed to give the Americans a certain participation in the concession for the Canton-Kowloon railway in exchange for a similar participation in the Canton-Hankow line, and, furthermore, the parties agreed to offer to each other a participation of one-half interest in any business thereafter obtained in the Empire of China.

Although this agreement is no longer in force, yet it constituted a precedent which at that time received the sanction of the British Government, and which the British and Chinese Corporation has extended to cover the other concessions entrusted to its care.

In the original concession granted to the Pekin Syndicate, Limited, it was given certain railway rights from the mines in Honan to the nearest navigable water, and the question arose of constructing a railway from the mines to Pukow, on the Yangtsze. The rights of the Pekin Syndicate thus conflicted with the concessions granted to the British and Chinese Corporation (Tientsin-Pukow, and Sinyang-Pukow lines) which had the port of Pukow as their base.

* The British and Chinese Corporation was registered on May 24, 1898, to carry on in China or elsewhere the business of contractors for public works, etc. The authorised capital is £250,000 in shares of £100, all of which has been subscribed, and £125,000 or £50 per share, called up. The accounts are made up annually to June 30, and submitted in November.

†The agreement appears in the British Parliamentary Bluebook, China, No. 1 (1899, page 325.)

CREATION OF THE CHINESE CENTRAL RAILWAYS, LTD

To avoid conflict and competition the two companies amalgamated their railway rights north of the Yangtsze river under the style of the Chinese Central Railways, Limited,* in the organisation of which the British and Chinese Corporation secured the controlling interest. As subsequent events have disclosed the official British Corporation made their first mis-step by this amalgamation, for although the Pekin Syndicate, Limited,† is registered as a British Company, a large percentage of its shares are held in France and Belgium, carrying representation on the Board of Directors. The British and Chinese Corporation thus shared their interest in two live and valuable concessions in exchange for the elimination of the claim of the other syndicate to a line terminating within its sphere of activity. Competition with its main business was, however, thereby defeated, and the official Corporation was ostensibly left in command of the railway situation north of the Yangtsze.

The British objective, as already stated, was to secure an extension of the Pukow-Sinyang line to Chengtu, in Szechuan, and the continued efforts of the Legation and the Company were concentrated in persuading the Chinese to cede the right. At the same time a group of French and Belgian capitalists, headed by the Banque de l'Indo-Chine, were also deeply interested in securing the concession for a line from the Hankow-Sinyang district westwards to Chengtu, and were bringing political pressure to bear on the Chinese Government for this purpose.

Two American syndicates had previously entered the field for the same concession and the then American Minister (Mr. Conger) at Peking approached the Chinese Government on their behalf as soon as it became known that a French combination was active. The Waiwupu in its perplexity between the claims of the various syndicates compromised by promising the American Minister in writing that if foreign capital became necessary for the construction of the line, preference would be given to Americans and British, who were the first applicants.

Dangerous competition thus entered the field to wrest from the British Corporation the right for this exceptionally valuable commercial and essential British political line and to avoid any possible interference with its commercial plans, and apparently disregardful of national considerations, the British Corporation entered into an agreement with the group of French capitalists and absorbed them by surrendering a large share of the

*The Chinese Central Railway Company, Limited was registered on January 7, 1904. The authorised capital is £101,000 in shares of £1, £100,000 being in ordinary shares and £1,000 in deferred shares, and the whole amount has been subscribed, and £41,000 paid up, the ordinary shares having 8s. called, and the deferred shares being fully paid. The deferred shares are entitled to receive half the profits of each year (which the directors may determine to divide) after the holders of the ordinary shares for the time being issued shall have received in dividends a sum equal to the amount paid up thereon, and upon any return of capital in a winding-up or otherwise the deferred shares are to be entitled to participate pari passu with the ordinary shares for the time being issued until the full amounts of the capital paid up on both classes of shares shall have been returned, and thereafter the deferred shares are to be entitled to have divided amongst them one-half of any surplus assets. Voting power, one vote for every ordinary share, and 100 votes for each deferred share.

†The Pekin Syndicate, Limited, was registered on March 17, 1897, for the purpose of obtaining and developing concessions for mining, railway, and other undertakings in China. In May, 1898, the syndicate acquired the sole right for sixty years to open and work coal and iron mines and petroleum deposits throughout certain specified districts in the province of Shansi, China, covering an area of approximately 20,000 square miles, and shortly afterwards a contract on similar terms was signed covering all that part of the province of Honan which lies to the north of the Yellow River. Certain railway rights were given under the concessions. The Chinese government is to receive a royalty of 5 per cent. on the prime cost of all minerals extracted; and of the net profits, after providing for 6 per cent. interest on capital employed, and setting aside 10 per cent. of the profits as a sinking fund the Chinese government is to receive 25 per cent.

national rights in the Pukow-Sinyang line which were entrusted to their charge for safeguarding.

THE 1905 AGREEMENT AND MONOPOLY

As this agreement* has materially modified the position of Great Britain in the Yangtsze Valley a brief synopsis of its principal clauses should prove illuminating. It was signed between Carl Meyer, of London, on behalf of a British Group consisting of the British and Chinese Corporation, Limited, the Pekin Syndicate, Limited, and the Yangtsze Valley Company†; and by Stanislas Simon, representing a body of French capitalists, consisting of the Banque de l'Indo-Chine, the Comptoir National de Escompte de Paris, the Société Générale, the Regie Générale de Chemin de Fer, and Messieurs N. J. and S. Bardac, and by the Chinese Central Railways, Limited.

The object of the agreement was to form a new combination for the monopoly of railway construction in the Yangtsze Valley, especially as concerned the Pukow-Sinyang and Sinyang-Chengtu railways. The essential feature of the agreement was to combine for the purpose of opposing and defeating all competition with the new Company in their plans for the construction of Chinese railways.

In the distribution of the 100,000 shares of the new Company, the French were to allot 7,500 shares out of their 50,000 to a Belgian Group, or the Compagnie Internationale d'Orient, and the Belgian Group were in turn to transfer 2,500 of these shares to the British Yangtsze Company, Limited; the British Group were also to allot 5,000 of their shares to the Belgian Group, and a further 7,500 shares to an approved American Group, and, in the event of the Americans not participating the final allotment of the shares would be 45,000 to the French, 45,000 to the British, and 10,000 to the Belgians.

The object of the agreement as set forth in the document is, in part, as follows, "and whereas the Chinese Central Railways, Limited, is at present entitled to the benefit of two agreements for railways to be constructed from Pukow to Tientsin, and from Pukow to Sinyang, and whereas the Company has been negotiating for some time past to obtain a concession and other rights in connection with a railway from the Hankow-Sinyang district to Chengtu and the French Group have been for some time negotiating to secure a concession for a railway from Hankow to Chengtu and have come into competition with each other, and for putting an end for such competition the Company and French Group agree to associate themselves in the manner and on the terms appearing."

Article 8 of the agreement provides that "The engineers and other Europeans engaged upon the said railway from Pukow to Chengtu, and of each railway that may be formed or controlled by the Company (other than the railway from Pukow to Tientsin) shall, so far as possible, be in equal proportions of British and French nationalities, and all orders for materials and rolling stock and plant and all contracts for construction of said railways (other than aforesaid) shall be divided in equal proportions between British and French manufacturers and contractors."

Article 11 says: "*The British and French Groups shall respectively agree that so long as they hold any share in the company respectively they will respectively use their best endeavors to oppose and defeat any schemes competing with the Company's main business.*"

The above agreement, then, discloses that whereas the administrative control remains in the hands of the Chinese Central Railways, Limited, the financial control passed to the French and Belgian bankers.

FRENCH AND BELGIAN CONTROL OF A BRITISH COMPANY

In the amalgamation of the Pekin Syndicate with the British and Chinese Corporation for their railway rights north of the Yangtsze River, the official organisation contributed as its assets two *bona fide* acknowledged railway concessions (the Tientsin-Pukow and the Sinyang-Pukow lines) and naturally secured the controlling interest of 60 per cent. of the stock of the orignal Chinese Central Railways, Ltd. The Pekin Syndicate, whose only asset was an indefinite claim for a line from the mines to deep water at Pukow, secured only 40 per cent. of the shares of the company. The exact proportion of the shares of the Pekin Syndicate, Ltd., held in France and Belgium, can only be ascertained correctly by reference to the books of the syndicate itself, but it is generally accepted that the French hold the controlling interest, and the Editor of the *Peking Gazette* recently made the statement, which has passed unchallenged, that the French interest in the Pekin Syndicate was 90 per cent. If only 50 per cent. is accepted as the French participation it is sufficient for the point we desire to accentuate. In the last Annual Report* of the Syndicate, published in December, the Directors publicly state that the Syndicate participates as to about 20 per cent. in the Chinese Central Railways, Ltd., which is their proportion of the shares allotted under the 1905 Agreement. This document allots 55 per cent. of the shares to the French and Belgians. If we add to this the proportion of French holdings in the Pekin Syndicate, or, say, 50 per cent., and the Syndicate has a 20 per cent. share in the Chinese Central Railways, Ltd., it is quite clear that the actual position of the French and Belgians in this British Official institution would be 65 per cent., or if the Editor of the *Peking Gazette* is sure of his facts, it would be increased to about by 3 per cent.

In other words, the Chinese Central Railways, Limited, which poses as the official British institution in the Tientsin-Pukow and the Pukow-Sinyang Railways, is no longer a British company except in name only, and proves irrefutably that the great British Government is being utilized as the catspaw of international finance to force through French and Belgian interests in China.

CHINA IN A FALSE POSITION

The change in the status of the Company was kept a profound secret, for no copy of the agreement was ever filed with the Chinese Government, who was most vitally interested, nor was it published. It is difficult to believe, too, that the British Government could consistently recognise or condone the stipulations of the agreement and preserve "face" with the Chinese, for we find that the official British Corporation deliberately handed over fifty-five per cent. in this purely British undertaking to the very interests to which China had granted the Peking-Hankow concession in 1898, and for which act she was penalised.

China was punished by Britain for granting this concession to Belgium and we know that on the authority of the French Yellow Book 60 per cent. of the Peking-Hankow syndicate shares were owned in France, yet the British official Corporation, after they had been paid the fine wrung from China, complacently divided the spoils with the French and Belgians. Was it a wilful insult to China or a simple betrayal of the national interests entrusted to their care?

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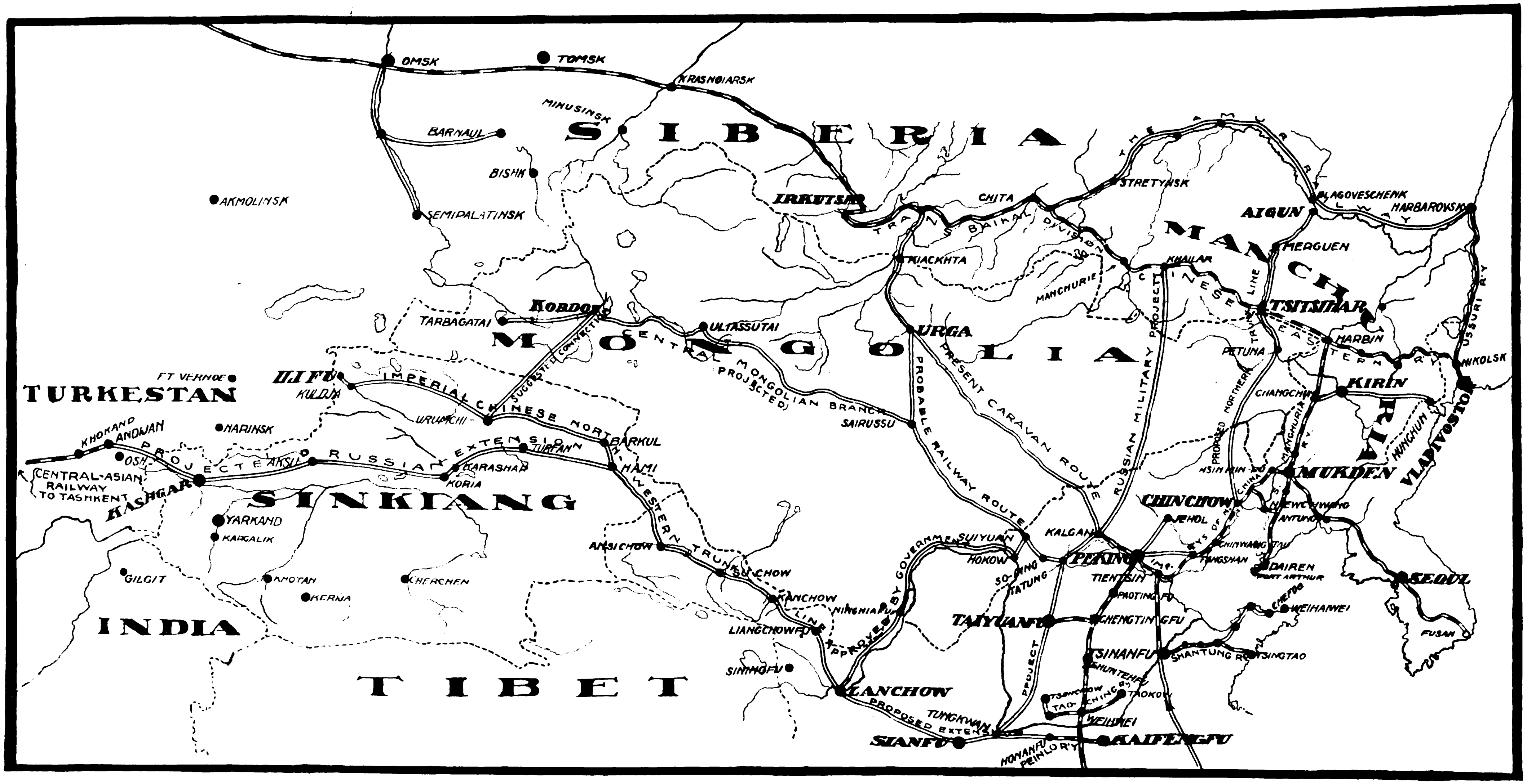
* The agreement is reprinted on page 305

† The Yangtse Valley Co., Ltd. was registered on December 28, 1900, in amalgamation of the Yangtse Valley Syndicate, Ltd., registered on May 27, 1899 and the Upper Yangtse Syndicate, Ltd., registered on June 27, 1899, to deal with properties and concessions in China. The authorised capital is £500,000, £200,000 being in priority shares of £1, £299,775 in ordinary shares of £1, and £225 in deferred shares of 1s. The priority shares are entitled to receive out of the first profits of the company dividends amounting in all to 100 per cent., and when such dividend shall have been paid all distinction between the priority and ordinary shares is to cease, and the net profits are then to be divided—50 per cent. amongst the ordinary shares, 40 per cent. amongst the deferred shares, and 10 per cent. amongst the directors. Only seven of the ordinary shares have been issued; of the priority capital £96,150 has been subscribed and paid up, and all the deferred shares have been fully paid. The company holds 96,800 fully-paid shares of £1 in the Electric Traction Company of Hongkong, Limited; 1,710 fully-paid shares of £1 in the Association General, Limited (the pioneer of the Singapore Electric Tramways, Limited); 2,500 ordinary shares of £1 (8s. paid), and 20 fully-paid deferred shares of £1 in the Chinese Central Railways, Limited; a one-fourth interest in the Province of Yunnan concession, held by the Syndicat du Yunnan, Limited; 5,000 ordinary shares of £1 (5s. paid), and 730 deferred shares of £1 fully paid in the Nippon Syndicate, Limited; and 2,000 ordinary shares of £5 (£1 5s. paid), and 250 deferred shares of 1s. (fully paid) in the British and Japanese Finance Corporation, Limited).

*The report of the Pekin Syndicate is published on page 310.

MAP SHOWING CHINA'S PRE-REVOLUTION RAILWAY PROGRAMME IN MONGOLIA AND SINKIANG



This map illustrates the plan the Chinese Government had in view in 1910 to counter the march of Russia through China. At that period there was considerable activity shown in certain circles to obtain the concession for the line through Sinkiang and Kansu into China—along the route now followed, in fact, by the Lung-Tsing-U-Hai Railway. The Chinese Government then talked of building a line with Chinese capital from Ili-fu to Lanchow, with an extension to Honan-fu, and with a line running from Lanchow north-eastwards to Hokow, on the Yellow River, where it would connect with the Kalgan extension, which is now being built. Likewise they projected the line from Tatung, south-west of Kalgan, southwards to Tungkwan to the south of Shansi province, which is now in the hands of the Belgians. The ideas of the Government of that day, however, have been lost sight of. The revolution altered conditions, and the line from Turkestan to Kaifeng, and from Tungkwan to Tatung, are in the hands of those whom the Chinese of 1910 did not wish to see in control. Comparison of this map (which is reprinted from the Far Eastern Review of March, 1910) with the one specially drawn to illustrate the present day situation will be interesting as showing the advance which has been made by the interested Powers since the Revolution

In view of the facts connected with the granting of the Pukow-Sinyang concession to Great Britain it is clear that the British Corporation surrendered the interests they were selected to safeguard, without due regard to the position of the Chinese Government, or the honor of the British Government. Somebody blundered. And by signing the final Sinyang-Pukow loan agreement in November last with the Chinese Central Railway, Limited, the Chinese Government has again been placed in a false position with respect to the British Government for it has unwittingly been led into a similar position to that in which it found itself in 1898. China becomes a party to another "breach of faith" by signing a contract for a purely British concession with a company whose financial control is vested the French and Belgians.

THE BRITISH GOVERNMENT COMPROMISED.

The essential feature of the agreement entered into between the British and French groups in 1905, was to do all in their power to oppose and defeat all competition with the Company's main business. The Company's main business was the financing and construction of railways in China under the departmental system which provided for the purchasing of materials through the banks acting as Purchasing Agents and receiving a commission of five per cent. for their services.

It is this feature which places the British Government in the most compromising position with its own independent financiers and manufacturers, for the Government, by supporting the agreement, becomes a party to the maintenance of an unjust monopoly fastening on China the most expensive system of railway construction, and obstructing the right of independent British manufacturers or railway contractors to do business with China.

The fact that this monopoly, under the protection of the British Government, was used to defeat all competition has been fully attested to by the experience of independent British manufacturers and contractors who have spent large sums in the useless endeavor to do business in China, and which, on several occasions, has led to official protests against the system.

As it is professedly against the principles of the British Government to discriminate in such matters and uphold a combination in restraint of the rights of other legitimate British enterprises, the existence of the agreement has been carefully concealed. Otherwise those firms who have unsuccessfully tried to conduct business in China would have a legitimate grievance and legal rights to compensation for the losses involved. Leaving these phases of the situation out of the question, however, it is clear that the monopoly did exist, and that the essential features of the Anglo-Franco-Belgian 1905 combination, having the support of the British Government, was to oppose and defeat all competition with the main business of the Company.

Rightly or wrongly the British Government has been made a party to this agreement by its continued support to the Company, thereby creating a precedent contrary to all ideas of a free government.

WHY INDEPENDENT FIRMS COULD NOT DO BUSINESS.

The situation arising out of this monopoly bears an important relation to the organization of independent British engineers to advance their interests in China. In the issue of THE FAR EASTERN REVIEW for August, 1911, was published a comprehensive review of the question of supplying Chinese railways with materials, and for special reasons, the article was written on behalf of American manufacturers, although the main argument was equally in support of the independent British manufacturers. It was entitled, "THE VIOLATION OF THE OPEN DOOR BY CHINA, or the reasons why American Manufacturers of Railway Materials could not secure Fair Play in the Awarding of Tenders under the present system of Railway Construction."

Although the 1905 Agreement was in our possession at that time, and we were fully cognizant of all the situations which had arisen as a consequence of the monopoly, we refrained from publishing or quoting it, feeling sure that the British Government was not officially aware of its existence.

We recognized at that time that the independent British manufacturers and their agents in China could never hope to secure free scope to obtain business under a system which delegated to a commercial concern the sole purchasing rights for the materials to be used in the construction of the railways.

In all of the British railway loan agreements with the official group, the departmental system of construction has been rigorously enforced, and the purchasing rights have always been delegated by the Corporation to the commercial firm of Jardine, Matheson & Co., one of its component parts.

As this firm is also the active selling agent for certain British manufacturers of railway material, rightly or wrongly the idea has been created in the minds of their competitors, that they favoured the manufacturers whom they represented.

There are many instances where this is not true, and where the independent firms have secured large orders in direct competition with the firm. It is only fair to state that the position of Jardine, Matheson & Company in this matter is an extremely delicate one, and they are able fully to justify their position. For although this firm acts as Purchasing Agents for the railways under construction, the actual awarding of the tenders has been made by the Managing Director of the lines, and the firm, thus relieved of the responsibility of being the actual purchaser, has at times openly competed for tenders, which were subsequently turned over to them for execution. There may be many fair and reasonable arguments adduced to justify a firm acting as the official purchasing agents for railways secured by the British Government to advance the national interests, in submitting tenders in competition with other firms, but a careful examination of all the points involved, indicates that the attitude is ethically incorrect. By permitting themselves to be placed in this false position, the official British Purchasing Agents have incurred the open hostility and criticism of the independent British manufacturers and their agents, who have failed to secure business in China. Several protests have been made to the British Legation against the operation of this system, but no steps were made to rectify the unfortunate situation until recently when the British Government was compelled by the danger of losing the important railway contract secured by the independent firm of Pauling and Company, and by the "Belgian" successes, to recognise that a change of policy was absolutely compulsory.

Under the terms of the 1905 Agreement, with its essential feature to oppose and defeat all competition with the company's main business, the British Government unfortunately become as party to this method of conducting business, and is open to the severest criticism from the British engineers and manufacturers for the maintenance of an unjust and unholy monopoly.

THE BRITISH ENGINEERS' ASSOCIATION

The failure of the independent British engineering firms to secure a fair share of the railway business in China, led to the organization of the British Engineers' Association. The organizers ascribed the failure of British engineers in China to the operation of American and German diplomacy and their commercial methods, being ignorant of the 1905 Agreement by which their rights had been transferred to France and Belgium, and under which their Government was a party to barring them from the field.

Eastern Engineering in its ignorance of the fundamental facts underlying the situation, rather narrow-mindedly ascribed the failure of British engineers to the machinations of THE FAR EASTERN REVIEW, and bitterly condemned us as being anti-British for our open comments on the very facts which gave justification for the formation of the Association. The paper has since carried on a systematic campaign amongst the engineering firms of Great Britain to undermine our position and destroy our usefulness, but if those firms will pause to realise how the Pauling contract, with its great possibilities in the way of sale of railway materials, got to England, and how the policy of the British Government was changed,—which facts *Eastern Engineering* ought to make known,—their eyes will be opened to a true conception of the situation.

With the publication in full in this issue of the 1905 Agreement, the independent engineers can now appreciate the full force of the reasons why they could not secure fair play in the construction of Chinese railways and in the supply of materials, and they will now fully understand the inner reasons which compelled them to organize in order to compete.

If the independent British engineers and contractors have a legitimate grievance, what can be said of the position of the Chinese Government, compelled as it was to submit to and accept the ironclad conditions of the extravagant departmental system of construction forced on it by the Banks and the foreign Governments in order to maintain a monopoly, the chief feature of which is the side profit to the Banks in the shape of the purchasing commission?

The services of the best purchasing agents in Europe or America could be secured on the payment of two per cent. commission. In the division of the five per cent. among the four groups in the Hukuang Railway Loan, one per cent. is set aside to defray the actual cost of conducting the purchasing by the two Agents, while the remaining four per cent. is divided equally between them!

EXCESSIVE COST OF RAILWAY CONSTRUCTION

It is no exaggeration to state that the cost of constructing railways in China under the cumbersome departmental system, has been 25 to 33 per cent. higher than the cost would have been if the construction had been entrusted to experienced and reputable railway contracting concerns. But the construction of railways in China under contract, with experienced builders, would terminate the rich and profitable departmental system, with its tidy five per cent. purchasing commission for the commercial end of the official organizations and thus interfere in its main business. So to preserve the system, and prevent the Chinese Government from ever realizing the truth by the admission of contractors to the field, the entire power and influence of the official groups has been brought to bear in opposition to their entrance.

When the British and Chinese Corporation was first organized in 1898, the leading firm of British railway contractors was admitted as a shareholder and an agreement was reached whereby the firm would construct under contract the Shanghai-Nanking line. The commercial element in the Corporation was, however, able to prevent the construction of the line by contract, and carried on the work departmentally. The construction cost of the line was £11,000 per mile. It may be said, however, that the average cost of constructing railways in China under the departmental system is about £9,000 per mile over ordinary country. There are no figures for contract work, except the cost of the Pekin Syndicate Railway (the Tao-Ching line) which was constructed under contract by the great British firm of engineers, Messrs. Pearson & Sons, and which exists to-day as one of the best built lines in the country. The actual cost of the line was under £7,000 per mile, which included the contractor's profit. This is £2,000 under the average cost of departmental built lines and £4,000 per mile cheaper than the Shanghai-Nanking railway. And for the purposes of Chinese traffic the Tao-Ching line meets the requirements of the country as well as the more expensive line.

Messrs. Pauling & Company, Limited, the greatest firm of railway builders in the world, signed a contract with the Chinese Government to construct and equip the Chinchow-Aigun Railway to the same specification as the Peking-Mukden line at a lump sum cost of £7,885 per mile. This provided for their profit, which indicates that the actual cost of the line would be about £7,000, or perhaps less. This corresponds with the actual cost determined by Messrs. Pearson & Sons on the Tao-Ching construction, and corroborates the argument of the lower cost when the work is carried out by experienced railway builders with an efficient organization to carry on the work.

Messrs. Pauling & Company also tendered for the construction and equipment of the Anhwei Railways for Lord Li Ching-fang, at a lump sum cost of £6,200 per mile, also to the same specification as the Peking-Mukden line, thus again indicating that the actual construction cost would have been under £6,000. This company furthermore approached H.E.Chang Chih-tung and offered to construct and equip the Canton-Hankow Railway to the same specification as the Shanghai-Nanking line for a lump sum of £8,000 per mile, indicating again that the actual cost would have been about £7,000 per mile, or £4,000 less than the Shanghai-Nanking line constructed under the departmental system.

STIFLING OF FREE COMPETITION.

These figures speak for themselves. They are official and on file in the records of the Chinese Government. They have been made by the most experienced British railway builders, whose names are a guarantee that the lines would be well constructed and so serve as an ample security for the bondholders. And yet, for fifteen years, with these figures staring them in the face—figures which must have convinced the most sceptical of the excessive charges of the departmental system—the official group has been able to hypnotize the British Government into opposing the entrance of the leading British contractors in the Chinese railway field. Both Messrs. Pauling & Co., Ltd., and Messrs. Pearson and Sons enjoy the reputation of being the most experienced railway and engineering contractors in the world, and the former concern alone has successfully constructed under the contract system thousands of miles of railways in different parts of the world to the entire satisfaction of the Governments and the Banks concerned. They constructed over 2,500 miles of railways for the Rhodesian Government alone. Yet with this magnificent record this British firm was never permitted seriously to compete with the official organization in China, until the representative of Dr. Sun Yat-sen negotiated a contract with them direct in London, and which was eventually signed in Shanghai without the interference of the British authorities or the knowledge of the official organization.

So for fifteen years China has been debarred from her legitimate right of free competition in the construction of her railways, and compelled to pay millions in tribute to a system whose only excuse for existence was the support of the various foreign Governments to the Banks who had inaugurated the purchasing commission to increase their profits without due regard for the interests or welfare of China, who had willy-nilly to pay the bills.

With the above exposition of the facts surrounding this phase of the matter, we may now return to a further consideration of the operations of the official syndicate.

THE PUKOW-SINYANG AGREEMENT

For several months past the British Legation has been urging the Chinese to comply with their obligations and give effect to the preliminary agreement for the Pukow-Sinyang Concession signed in 1898, and, on November 14 last, the final agreement was duly signed by the Ministers of Communications and Finance for the Chinese Government of the one part and by the representative of the Chinese Central Railways, Limited, of the other. It has taken about 15 years to get this through, and British interests were highly elated at the ultimate success of the long-drawn out Yangtsze concession.

The final Pukow-Sinyang agreement was signed as a purely British undertaking, providing for the appointment of British engineers and the purchase of the materials from Great Britain.

Even the French were happy. They were joyous and heartily congratulated the British on their success, for were they not equally interested, and, with the Belgians, did not 55% of the profits pass into their coffers? *Vive l'entente cordiale!* It was only another happy illustration of the friendly, sympathetic co-operation of international finance. This jubilation on the other side of the Channel came, however, as a sort of surprise to interested sections in Great Britain who could not account for such unseemly joy, and refused to understand how the French could be so deeply interested in what had always been held as the crowning triumph of Britain in the Yangtsze Valley.

Who had blundered? The representative of the Chinese Central Railways in Peking, who should have remembered the agreement under which his Company was operating, had apparently forgotten all about its existence, and, in negotiating the final Pukow-Sinyang contract with the Chinese,

had overlooked the fact that the French had equal rights to the appointment of engineers and in the supply of materials. Of course, this was only a trivial oversight, readily adjusted among friends, but one which would be difficult of explanation to the British public and the British manufacturers when half the orders for materials were placed in France and French engineers appeared on the line.

The French insist on adhering to the terms of the 1905 agreement, but the British Government cannot publicly admit that after exacting the penalty from China it had turned round and divided it with France and Belgium. The only honorable course to pursue would be to cancel the concession rather than suffer the loss of prestige involved in recognition of such a doubtful transaction.

ON THE HORNS OF A DILEMMA

The British Government is placed in the position of being false to China; of having to incur the displeasure of France, and of antagonising its own manufacturers. Notwithstanding all the pronouncements of British policy in China, the careful delimitation of the Yangtsze Valley as a special British preserve, and the erection of a ringed fence to keep trespassers out, the gate had been deliberately unlocked by the guardians, and the French and Belgians, with their Russian partner, were secretly admitted within the sacred precincts, and quickly became busily engaged in garnering the rich and choice financial plums from the Celestial orchard.

The Pukow-Sinyang agreement of November last, which compelled the disclosure of the secret 1905 contract, determined the British that their frolicsome and adventurous French and Belgian play-fellows must be induced to vacate the garden of Eden before all the ripe fruit was plucked from the trees and before the facts became known to the British public.

While all this was going on and the British were apparently justly indignant to find their adventurous rivals inside the fence, and while they were seriously devising schemes to get them out, another gleeful and vivacious claimant for concessions gambolled into the Valley—aided this time by its Celestial sweetheart—sat down under the shade of the two trees bearing the largest and most juicy fruit, and notified the others that it had decided to take what it could as its share. This daring and impudent intruder introduced himself as M. le Banque Industrielle de Chine, s'il vous plait! domiciled in Paris, where he had contracted a left-handed marriage with a Chinese affinity, who had graciously presented him with these special trees as a wedding present.

This sublime audacity staggered the British, as one of these special trees flourished at Hankow while the other grew within the confines of Pukow, the great future port for the lower Yangtsze, the terminus of the Tientsin-Pukow, and the Sinyang-Pukow lines, and the stepping off place to the Shanghai-Nanking line; or in other words, the most sacred spot marked out by the official British Company (the Chinese Central Railways, Limited) as its special sphere of activity.

The agent of the Chinese Central Railways, Limited, exploded when he was informed of this invasion into the holy of holies, and forthwith protested against the impudence of the unwelcome financial roisterer who had secured possession by a secret loan for the development of the ports of Pukow and Hankow. The two great centres of Britain's sphere had therefore been appropriated by M. le Banque Industrielle de Chine, under their very noses. This was too much. French trespassers must be taught a lesson. They must be cajoled to run away and play somewhere else or be ejected. but it would appear that the intruder possesses some claim to a share within the ringed fence, for it is an offspring of one of the great syndicates comprising what is known as the Chinese Central Railways, Limited, which, as has been previously explained, owes its origin to the amalgamation of the British and Chinese Corporation with the Pekin Syndicate, Limited. The latter, although a thoroughly respectable British registered concern, has, as already explained, most decided French and Belgian proclivities, which may account for the unusual readiness of the Chinese Central Railways, Limited, to enter into the 1905 compact.

THE BANQUE INDUSTRIELLE DE CHINE

The Banque Industrielle de Chine came into existence during the month of January, 1913, when the French promoters secured the co-operation of the Chinese Government by admitting the Chinese to a one-third interest, and during the first week in June last the shares were offered to the public in London and Paris. The capital was francs 45,000,000, divided into 87,000 ordinary shares of francs 500 each, with 3,000 founder's shares of francs 500 each. The significant feature of the prospectus issued to the public was the fact that 40,036 ordinary shares were reserved for subscription at par for the shareholders of the Pekin Syndicate, Limited, and two directors of the Syndicate were the promoters of the bank. We find on analysis that the distribution of the shares would be about as follows, if the prospectus preference was taken up.

Chinese Government, one-third	29,000
*Pekin Syndicate shareholders	40,036
Public subscription	17,964
Total	87,000

These figures would indicate that the actual control of the bank is, or could have been, in the hands of the shareholders of the Pekin Syndicate, a strictly British officially registered organisation, which in this new concern, transferred its allegiance under French Company laws. And it also discloses that the Pekin Syndicate, Limited, one of the official custodians of British rights in the Yangtsze Valley, deliberately participated in the organisation of a bank under the laws of France, the first transaction of which was to steal away the rights entrusted to its care by the British Government. Was there ever such a pitiful picture of financial intrigue and deceit?

The sublimely ridiculous picture is also presented of the British agent of the Chinese Central Railways, Limited, protesting in virtuous indignation against the trespass on the preserves of his company by the loan signed for the re-building of Hankow, and the construction of a port at Pukow by the French Banque Industrielle de Chine, a subsidiary of one of his own principals. *And the British Government protests against China for attempting to internationalise the Yangtsze Valley, when in reality China was but following the path laid by the British official organisation when it shared the British concession for the Pukow-Sinyang railway with French and Belgian interests and thereby itself internationalised what the British Government believed to be its particular sphere.*

POSSIBLE FRENCH REPRISAL

In the meanwhile, nettled at the hesitancy to comply with the honest provisions of the 1905 compact, the French, with the innate sagacity of the nation, are not awaiting quietly the final shove that will oust them from their share of the concession. They are showing no outward signs of displeasure against the wave of patriotic British sentiment to hold the Yangtsze Valley as a British preserve. No, China is extensive and wealthy in resources, and there are other quiet corners where valuable rights can be acquired simply by asking the Chinese Government for them. And the Chinese are just waiting to be asked.

Now it happens that the British and French Government have a mutual understanding to share equally in any railway construction in the provinces of Yunnan and Szechuan, though is is not clear whether or not this understanding extends to the French interests in the Szechuan section of the Tatung-Chengtu line, recently granted to the Société Génerale de Belgique. It would be interesting to know.

In the great through western trunk line which will connect Russia on the north and Yunnan on the south the line from Yunnanfu to Chengtu or Chungking had still to be provided for. What is more natural than that the French Government at this psychological moment should kindly request the Chinese for the right to construct the line from Yunnanfu to Szechuan well knowing that the friendly officials could not say them nay? And what is more natural, after securing this choice section from China, than that the French Government should politely convey

*See report of the Pekin Syndicate on page 310 of this issue.

its compliments to the British Government and add that it could have the Pukow-Sinyang line to itself, while the French, in view of the hesitancy of the British to acknowledge their rights under the 1905 agreement, were consequently reluctant to admit the British to a half share in the Yunnan-Chungking or Chengtu line, and would therefore construct the railway without their assistance ?

A brilliant stroke of diplomacy ! France would gain for the loss of her share in the Pukow-Sinyang line the sole rights to a through railway from Haiphong to Chungking or Chengtu, or both. At Chengtu she would link up with the " Great Achievement " of the Russo-Belgian combination, thus clasping hands across China with her ally on the north, and also would have the control of a large section of the line eastwards to the Hupeh border as provided for in the Paris meetings of the Hukuang negotiations—a section which is shortly to be proceeded with, as reported elsewhere.

Once this last link is in her control France will dominate the entire west of China and divert all the trade to her port of Haiphong. The line from Yunnan to Nanning, which has already been promised to her by the kindly Chinese, will then be shelved and never be built, so that control of the west will not pass from her hands.

This situation, so disastrous to China, has been brought about by the failure of the official British Group to recognise the rights of the French in the Pukow-Sinyang loan agreement. It is a situation fraught with the greatest danger to China. The granting of the Yunnan-Chungking or Chengtu line as an exclusive French concession would constitute the last nail in China's coffin. The coffin is prepared, the corpse enclosed, and the undertaker stands ready, hammer in hand, to drive the nail home.

The French Minister, while this article was being written, actually secured from China the right to construct the Yunnan-Szechuan railway for French interests.

The Chinese, as usual, have been compelled to bow to the inevitable, and Great Britain has received a severe set-back from France, solely as a result of the grasping aspirations of the Official British Group. In November of last year an Anglo-French syndicate, represented in Peking by a British subject, endeavored to obtain the right to build the Yunnan-Chungking or Chengtu railway, and, by virtue of the combination of French and British interests and the agreement existing between the two Governments to share railway enterprises in Yunnan and Szechuan, stood an excellent chance of receiving the full support of the French Minister. In fact we are not wrong in saying that support was promised by the French Minister, but he was compelled to modify his attitude immediately upon the signing of the Pukow-Sinyang agreement on November 14 last and the consequent development of the situation created by the official British organisation. The deliberate disregard of French claims in the Pukow-Sinyang agreement compelled the French Minister to act promptly, and immediately he began to look after the interests of an organisation more French than British. So rapidly did things move, indeed, that the Anglo-French Syndicate was completely side-tracked, and, by January 21, an option was signed for the Yunnan-Szechuan line—with whom ? With that interloper in the Yangtsze Valley, the *Banque Industrielle de Chine !* And thus France gave Britain the Roland for her Oliver.

REASONS WHY THE 1905 AGREEMENT STANDS.

In the meantime the 1905 Agreement has been the subject of considerable discussion. It is claimed that in signing the final Pukow-Sinyang Agreement and ignoring the provisions of the 1905 Agreement for the equal participation of the French in the supply of materials and the appointment of engineers, the representative of the Chinese Central Railways, Limited, must have overlooked the most vital essential in the reasons for the agreement. As the final Pukow-Sinyang Agreement was signed with the Chinese Government with the full knowledge of the British Legation, it is also apparent that the existence of the 1905 compact was temporarily forgotten. Such a striking case of official amnesia is all the more extraordinary, inasmuch as it was only four years ago that the existence of the agreement was officially recalled to the attention of the American Government by the British Foreign Office, to justify the reasons why the American Group should not be permitted to participate in the Triple Hukuang Railway Loan.

The failure of the American Bankers immediately to respond to the rather superior condescension of the British official group in allotting the shares, was construed by the latter as a waiving of the American rights to participation in the Hankow-Szechuan Railway, provided for in a letter written by the Waiwupu in 1904 to the American Minister (Mr. Conger). The 1905 Agreement was then not only officially advanced by the British Government as a fair reason why America should not be admitted to the Hukuang Loan, but it is also on record that when the Agreement was first made, the British Minister at Washington officially recommended the American Government to instruct its bankers to communicate with the Chinese Central Railways, Limited, if they desired participation.

It is also on record that the 1905 Agreement was entered into with the knowledge, and presumably the approval, of the British Government, thus making the Government, beyond the shadow of a doubt, a full party to all that transpired. It is difficult to believe, however, that the British Foreign Office ever gave the matter more than a passing thought, and it is charitable to say it must totally have failed to realize all the points involved in such a transaction.

It has also been urged that the 1905 Agreement was nullified or supplemented by the terms of the Hukuang Loan Agreement, but such a contention can only blind those unacquainted with the true facts. The British Group in the Hukuang Loan, although officially represented by the Hongkong and Shanghai Banking Corporation, consists of the British and Chinese Corporation and the Chinese Central Railways, Limited.

In the distribution of the profits and participation of the British Group in this Loan the following arrangement was finally arrived at:—

Of the total loan of £6,000,000 the portion appertaining to the Hankow-Canton section is £3,000,000 and the portion appertaining to the Hankow-Szechuan section is £3,000,000.

The Chinese Central Railways, Limited, takes no participation in the Hankow-Canton section, the profits of which, whether from flotation or commission on materials, are divisible equally between the British and Chinese Corporation, Limited, the German Group, the French Group, and the American Group.

The British and Chinese Corporation, Limited, and the French Group take no participation in the Hankow-Szechuan section, the profits on which, whether from flotation or commission on materials, are divisible, two-fourths to the Chinese Central Railways, Limited, one-fourth to the German, and one-fourth to the American Groups.

For facility of division it was agreed that the portion of the loan to be floated in London, £750,000, should be deemed to be floated on account of the British and Chinese Corporation, Ltd., and £750,000 on account of the Chinese Central Railways, Ltd.

Of the portion to be floated in Paris by the Banque de l'Indo-Chine £750,000 should be deemed to be on account of the Chinese Central Railways, Ltd.

In the final arrangement for the appointment of the engineers and the purchasing agency rights for the extension of the line to Chengtu, it was arranged that the chief engineer for the first 400 kilometers was to be appointed by the American Group, for the next 600 kilometers by the British Group, and the remaining 600 kilometers by the French Group, and it was also arranged that the purchasing agency rights for the proposed extension would go with the appointment of the chief engineer.

It is thus clearly established that the Chinese Central Railways, Ltd., secured its full participation in the Hukuang Loan from the other parties. The company was honorably and justly dealt with in the division of the profits and its future participation.

Yet, when the time arrived for the combination to repay its obligation, by admitting participation in the Pukow-Sinyang section, the official British company (excepting the Chairman

of the British and Chinese Corporation, who admitted at the annual meeting in London that other nationals had the right to share in the Pukow-Sinyang railway) suffered a mental hiatus and conveniently overlooked that the French partners in the company were entitled to one half the materials and engineers, which stipulation should have been incorporated in the Loan Agreement.

But this action would have revealed the truth to the Chinese Government, which was the last thing that the official corporation desired, so the facts were concealed and the Pukow-Sinyang Loan Agreement was signed as a purely British undertaking.

The signing of this agreement under these circumstances may have appeared quite justifiable to the British official organization, as it had the support of its Government, but the fact that the rights which were wrung from China as a penalty for her signing the Peking-Hankow Loan were afterwards divided with the French, and Belgians did not seem to trouble their conscience.

THE CHINESE GOVERNMENT'S POSITION

But how about the position of the Chinese Government? Under the circumstances was not the Pukow-Sinyang Loan Agreement obtained from the Chinese Government under false pretenses?

Article 23 of the Final Agreement expressly stipulates as follows:—

"The Company may, subject to all its obligations under this agreement, transfer or delegate all or any of its rights, powers and discretions thereunder to *any British Company, Directors or Agents* with power of further transfer and sub-delegation; such transfer, sub-transfer, delegation or sub-delegation to be subject to the approval of the Director General."

Has the Chinese Government ever been officially informed of this transfer by the 1905 agreement of the British rights to French and Belgian interests? If these rights have been transferred and the status of the company changed, is the Loan Agreement valid? It may be urged that although the large majority of the shares are held in France and Belgium, that the company remains British and its status is not altered.

The American Government advanced this same argument in 1905, and furthermore, guaranteed the American character and status of the American-China Development Company, notwithstanding the fact that the Belgians had secured control of the shares by private purchases in the market. The Belgian controlling interest in the American company was never approved by the American Government, as the British Government approved the transfer of British rights in the 1905 Agreement. The attitude of the American Government at that time did not, however, satisfy the Chinese, who strongly insisted on the cancellation of the concession for this breach of the Agreement.

This view point of the Chinese had, at the time, the moral support of British interests in China, and the British press were loudest in their denunciations of the betrayal of China by the Americans. Every honest thinking American fully concurred in the Chinese attitude, and the American Government was compelled to do justice to China by permitting China to repurchase the right to the concession.

And yet, at the very time that the Hankow-Canton Redemption Loan was being signed with the Hongkong Government, and the British official institution was being made the medium for the loan, the proceeds of which were to be employed in repurchasing the concession from the Americans, the British official group, with all these facts clearly before them, were busily engaged in handing over to the French and Belgians, with the approval of its Government, the controlling interest in a purely British concession.

The date of signing the Hankow-Canton Redemption Loan is not given, but it became effective on October 6th, 1905, thus clearly indicating that it had been drawn up some time in advance. The Agreement in which the British official Group ceded its rights to the French and Belgians was signed on October 2nd, 1905, or four days before the other document became effective.

China is weak and passing through the greatest crisis in her long history. Harried and bullied on all sides by aggressive foreign interests she is struggling to maintain law and order, preserve her integrity and consolidate the authority of the President throughout the country. China is not in a position to demand justice. She cannot approach the British Government at this crisis in her affairs and request fair play. She is in the hands of the official financial institutions, and needs their assistance to tide over the crisis. She cannot antagonize these institutions just now, for they would retaliate in the money market. China can only hope for the justice that is due to her by depending upon that innate sense of fair play and equity characterestic of all true Britons. China looks to Great Britain as her best counsellor, and President Yuan holds Sir John Jordan, the British Minister at Peking, as his most cordial friend. The British position in China has been seriously undermined by the knowledge of the 1905 Agreement, and although no official remonstrance may ever be made, the advance of British interests in the future will hinge largely on the attitude assumed by the British Government in connection with the 1905 Agreement. The good name of the British Government demands some action in this matter. There is only one amende honorable. Will it be made ?

THE HUKUANG RAILWAYS

The Chinese Government has concluded an arrangement with the banks of the four Powers (Great Britain, Germany, France and the United States), for the extension of the Hupeh-Szechuan Railway from Kueichowfu, viâ Chungking, to Chêngtu, involving the construction of over 500 miles of line. The financial arrangements will be equally shared by the four groups, but the French will benefit principally in the matter of construction, as no share of the construction of the system provided for by the Hukuang Agreement was allotted to them. Details have not yet been settled, but it is understood that surveying will be begun forthwith. As regards terms, the banks, of course, require a reversion to those known as the Canton-Kowloon Railway terms, by which the railway itself constitutes the security, together with the usual guarantees relating to expenditure and accountancy.

THE 1905 AGREEMENT

Agreement Between Certain British Corporations, a Group of French Capitalists and Chinese Central Railways, Limited, for the Construction of the Sinyang-Pukow and Hankow-Chengtu Railways

Memorandum of Agreement made the 2nd day of October, 1905, Between Carl Meyer of 4 and 5 King William Street in the City of London on behalf of a body of English capitalists consisting of the British and Chinese Corporation, Limited, the Pekin Syndicate, Limited, and the Yangtse Valley Company, Limited (who with their successors and assigns are hereinafter called the British Group) of the first part, Stanislas Simon, of 15 bis Rue Lafitte, Paris, in the Republic of France on behalf of a body of French capitalists consisting of the Banque de l'Indo-Chine, the Comptoir Nationale d'Escompte de Paris, the Société Générale, the Regie Générale de Chemins de Fer and Messieurs N. J. & S. Bardac (who with

their successors and assigns are hereinafter called the "French Group") of the second part and the Chinese Central Railways, Limited (hereinafter called the "Company") of the third part.

Whereas the Company was registered as a Company with limited liability under the Imperial British Companies Acts 1862 to 1900 on the 7th of January, 1904.

And whereas 'the said company was formed by two of the parties forming the British Group for the purpose of acquiring and dealing with concessions and other rights in connection with railways in China and elsewhere and for other purposes mentioned in the Memorandum of Association of the Company.

And whereas there have been issued to the British Group 50,000 shares of £1 each on which the sum of 8s. per share has been called and paid up.

And whereas the Company is at present entitled to the benefit of two agreements, short particulars whereof are set forth in the schedule hereto and which refer to railways proposed to be constructed from Pukou to Tientsin and from Pukou to Sinyang respectively.

And whereas the Company has been for some time past negotiating to obtain a concession and other rights in connection with a railway from the Hankow-Sinyang District to Chengtu in the Province of Szechuan and the French Group have been for some time past negotiating to obtain a concession and other rights in connection with a Railway from the Hankow-Sinyang District to Chengtu and they have thereby come into competition with each other.

And whereas for the purpose of putting an end to such competition the Company and the French Group have agreed to associate themselves together in the manner and on the terms hereinafter appearing.

And whereas *it is an essential term of the agreement that the British Group and the French Group shall so far as regards matters within the scope of the company's objects do all in their power to oppose and defeat all competition with the Company.*

Now these presents witness that **it is hereby agreed** by and between the parties hereto as follows:

1.—The capital of the Company shall be forthwith increased by the creation of 1,000 Deferred Shares of £1 each, which shall be entitled to receive between them one half the surplus profits of each year (which the Directors may determine to divide) after there shall have been paid by way of dividend or bonus to the holders other than the Deferred Shares a sum equal to the nominal amount of such shares and also to rank pari passu in any return of capital in a winding-up or otherwise until the full amount paid up on all the shares of the Company for the time being issued shall have been returned and thereafter to receive one half of any surplus assets and on the terms that each deferred share shall upon a poll confer 100 votes in respect thereof upon the holder thereof.

2.—Of the said deferred shares 550 numbered 1 to 550 inclusive shall be forthwith allotted to the British Group and the remaining 450 numbered 551 to 1,000 inclusive shall be issued to the French Group. All the shares so allotted shall be paid up in cash at once.

3.—There shall also be allotted in the proportions below mentioned to the French Group or to persons nominated by them whose pecuniary responsibility shall be undoubted the remaining 50,000 shares of the original share capital and there shall be forthwith called and paid up on each such share the sum of 8s. and all calls thereafter made on the said shares shall be paid in due course. Of the said 50,000 shares 7,500 shall be allottep to the Compagnie Internationale d'Orient or their nominess (hereinafter called the Belgian Group) and 2,500 shares out of such 7,500 shall be transferred or the benefit thereof made over to the Yangtsze Valley Company, Limited, on such terms and conditions as the British Group shall think fit. Of the 50,000 shares held by the British Group or their nominees 5,000 have already been transferred to the Belgian Group and in the event of certain American capitalists to be approved of by the British Group (hereinafter referred to as the American Group) agreeing within twelve months from the date hereof as to which time shall be of the essence of the contract to accept such participation but not a smaller one in the Company the British Group shall transfer or make over the benefit of a further 7,500 shares out of their 50,000 shares to the American Group but only upon such terms and conditions as the British Group shall think fit and in the event of the American Group not agreeing within the time aforesaid to participate as aforsaid the British Group shall transfer 2,500 out of the 7,500 shares to the French Group and shall retain the remaining 5,000 for themselves so that in the event of the American Group not participating the said 100,000 shares will be held as to 45,000 by the British Group or their nominees as to 45,000 by the French Group or their nominees and as to 10,000 by the Belgian Group or their nominees. None of the said 100,000 shares shall save as aforesaid be sold, transferred mortgaged or otherwise dealt with without the consent of the British and French Group for a period of five years from the date hereof and before the transfer of the shares aforesaid to the Belgian and American Groups agreements to the like effect to this Clause shall be entered into by them and by the Belgian Group also relating to the shares already transferred to them as aforesaid.

4.—The number of Directors of the Company shall be increased to 18, of whom 9 shall be from time to time appointed by the holders of the 550 deferred shares number 1 to 550 inclusive or of a majority of them and the remaining 9 shall be from time to time appointed by the holders of the remaining 450 deferred shares numbereed 551 to 1,000 inclusive or of a majority of them.

5.—The 9 Directors from time to time appointed by the holders of the said 550 deferred shares shall be appointed a permanent committee of the Board sitting in London and the 9 Directors from time to time appointed by the holders of the said 450 deferred shares shall be appointed a permanent committee of the Board sitting in Paris, but all resolutions of the said Committees in London and Paris shall be subject in all respects to the control of the Board of Directors of the Company and to all resolutions of the Board affirming, disaffirming or otherwise dealing with the same directly or indirectly.

6.—The Chairman of the Board and also any person temporarily appointed to preside in his absence at a meeting of the Board or of the Company shall be a natural born or naturalised British subject and be from time to time elected by the Directors appointed by the holders of the said 550 deferred shares out of the directors appointed by the holders of such shares and such Chairman or other person shall in addition to any votes he may already posess have a casting vote at such meeting of the Board and of the Company. Meetings of the Board shall be held in London or Paris as may be determined by the Board. The General Meetings of the Company shall be held in London. The Chairman of the Paris Committee shall be appointed by the members of such Committee and the Chairman of the London Committee shall be the Chairman of the Board of Directors of the Company.

7.—The French Group shall forthwith on the execution hereof vest in the Company the benefit of all negotiations entered into by or in its behalf in regard to the said concessions and rights in competition with the British Group and all surveys made in connection therewith and shall give to the company all documents and information in its possession relating thereto and the Company shall thereupon repay to the French Group such a sum as in the opinion of the Board of Directors of the Company shall represent the amouut of the expenses incurred by the French Group therein and properly attributable thereto.

8.—The Engineers and other European employees engaged upon the said railway from Pukou to Chengtu and of each railway that may be formed or controlled by the Company (other than the said railway from Pukou to Tientsin) *shall so far as possible be in equal proportions of British and French nationalities and all orders for material, rolling stock and plant and all contracts for construction of the said railways (other than aforesaid) shall be divided in equal proportions between British and French manufacturers and contractors.*

9.—It shall also be an essential term of the contract that no change shall be made in the character or political status of the Company or of any railways formed or controlled by the Company. All concessions and other like rights and privileges obtained by or for the Company shall be taken in the name of the company.

10.—All companies that may be formed by or under the auspices of the Company or in connection with any railways or other concerns in which it is interested shatl be Chinese Companies. If that should appear undesirable the said companies shall be of the same character as the Company and similar provisions to these herein contained in relation to the political character and status of the Company shall apply to each company so formed.

11.—The British and French Groups shall respectively agree that so long as they hold any shares in the Company respectively they will respectively use their best endeavors to oppose and defeat any schemes competing with the Company's main business.

12.—The voting power of the British and French Groups and of their nominees in respect of the shares of the Company for the time being held by them or on their behalf shall be used against and shall not be used in favour of any resolutions which may tend to contravene the provisions of this present contract and the Directors of the Company shall be authorised to disregard all votes given in contravention of this clause.

13.—No shares shall be transferred out of the names of the British, French, Belgian or American Group or their nominees to any companies or

persons except upon the terms that such companies or persons shall bind themselves by the terms of this agreement and the Board shall refuse to register all transfers made in contravention of this agreement.

14.—The Articles of Association of the Company shall be altered in such manner as to give effect to the provisions of this agreement.

In witness whereof the said parties to these presents have hereunto set their hands the day and year first above written.

THE SCHEDULE ABOVE REFERRED TO:

6th January, 1899.—Preliminary Agreement of this date made between His Excellency, Sheng, Director-General of the Imperial Chinese Railway Administration, acting under the authority of the Tsung-li-Yamem of the one part, and the British firm of Jardine, Matheson & Company for themselves and on behalf of the Hongkong and Shanghai Banking Corporation, of the other part, jointly representing a British syndicate adopting the terms of the Preliminary Agreement signed by the above mentioned contracting parties on the 13th day of May, 1898, for the financing, construction and working of a railway from Shanghai to Nanking as a Preliminary Agreement for the construction and working of a railway from Pukou to Sinyang in the Provinces of Kiangsu, Nganhui and Honan.

18th of May, 1899.—An agreement of this date made between their Excellencies Hsu and Chang duly authorized to act on behalf of the Imperial Government of China of the one part and (A) The Deutsche Asiatische Bank, (B) the Hongkong and Shanghai Banking Corporation for themselves and on behalf of Messieurs Jardine, Matheson and Co. as joint Agents for the British and Chinese Corporation, Limited, thereinafter called "the Syndicate" for the provision jointly by the Deutsche Asiatische Bank and the British and Chinese Corporation of a loan and for the construction and working of a railway from Tientsin to the Yangtzekiang.

(Signed) CARL MEYER.

Witness to the signature of Carl Meyer on behalf of the British Group

WATER HENDERSON,
Sol., 31 Lombard Street, London.

(Signed) S. SIMON.

Witness to the signature of Stanislas Simon on behalf of the French Group

(Signed) THO. GILBERT.
Secretary, Chinese Central Railways.

Witness to the signature of Thomas Gilbert for and on behalf of the Gentral Chinese Railways, Limited.

WATER S. HENDERSON,
Sol., 31 Lombard Street, London.

THE PUKOW-SINYANG RAILWAY

FULL TEXT OF THE LOAN AGREEMENT

The following is the text of the Loan Agreement for the construction of a railway between Pukow and Sinyang:—

This Agreement is made at Peking on the 14th day of November 1913, corresponding to the 14th day of the 11th month of the 2nd year of the Chinese Republic, and the contracting parties are:—

The Government of the Republic of China (hereinafter called "The Chinese Government") acting through its Minister of Finance, its Minister of Communications, and the special Commissioner appointed to negotiate the present Agreement, of the one part, and Chinese Central Railways, Limited, London (hereinafter called "The Company") of the other part.

Whereas a preliminary Agreement was signed in respect to the Pukow-Sinyang Railway Loan on January 6th, 1899, corresponding to the 25th day of the 11th month of the 24th year of Kuang Hsu, it is now agreed that this final Agreement shall be substituted for the said preliminary agreement, and this final Agreement witnesseth as follows:—

ARTICLE 1

The Chinese Government hereby authorises the Company to issue a five per cent. (5%) Gold Loan for an amount of £3,000,000. The Loan shall be of the date on which it is issued to the public and shall be called "*The Chinese Government Five Per Cent. Pukou-Sinyang Railway Loan.*"

ARTICLE 2

The Loan is designed to provide capital for the construction of a Government line of Railway from a point on the Tientsin-Pukow Railway, Southern Section, to a point at or near Sinyang on the Peking-Hankow Railway, a distance of about three hundred and fifty miles.

The route to be followed between these two points shall be decided upon by the Director-General of the Railway after completion of the final survey.

ARTICLE 3

The capital so provided shall be solely devoted to the construction of the railway line, including the purchase of the land, rolling stock and other equipment, and to the working of the line and to payment of interest on the loan during the period of construction, which is estimated at 3 years from the actual beginning of the works, the commencement of which is not to be delayed beyond six months from the date of the signature of this Agreement, within which period the Company shall notify the Director-General that a sum not exceeding £200,000 has been placed at the disposal of the Railway Administration, to be held in Europe or remitted to China as it may direct, as a first instalment on account of the proceeds of the loan. This amount of £200,000 or whatever portion thereof is actually advanced, together with interest thereon not exceeding a charge of six per cent. (6%) per annum, shall be deducted from the proceeds of the sale of the bonds.

ARTICLE 4

The rate of interest for the loan shall be five per cent. (5%) per annum on the nominal principal, and shall be paid to the bond-holders half-yearly. The said interest shall be calculated from the date on which the loan is issued to the public and shall be paid by the Chinese Governmen during the time of construction either from the proceeds of the loan or from other sources, and afterwards in the first place, out of the revenues of the railway, and then from such other revenues as the Chinese Government may think fit to use for the purpose in half-yearly instalments according to the amounts specified in the schedule attached to this agreement and fourteen days before their due dates, Western Calendar, as calculated half-yearly from the date on which the loan is issued to the public.

ARTICLE 5

The term of the loan shall be forty (40) years. Repayment of principal shall commence from the eleventh year from the date of the loan and, except as provided in Article 6 hereinafter, shall be made by yearly amortisation to the Hongkong and Shanghai Banking Corporation out of the revenues of the line or such other revenues as the Chinese Government may think fit to use for the purpose according to the amounts specified in the schedule attached to this agreement, but fourteen (14) days before their due dates, Western Calendar, as calculated from the date on which the loan is issued to the public.

ARTICLE 6

If at any time after the lapse of ten (10) years from the date of the loan the Chinese Government should desire to reduce the whole outstanding amount of the loan or any part of it not yet due for repayment in accordance with the schedule of repayments hereto attached, it may do so until the twentieth (20) year, by payment of a premium of 2½% (two and half per cent.) on the face value of the bonds, that is to say, by payment of one hundred and two pounds and ten shillings for each £100 bond, and after the 20th year without premium; but in each and every case of such extra redemption, the Chinese Government shall give six months' notice in writing to the Company and such extra redemption shall be effected by additional drawings of bonds to take place on the date of an ordinary drawing as provided for in the prospectus of the loan.

ARTICLE 7

The Hongkong and Shanghai Banking Corporation having been appointed by the Company Agents for the service of the loan the payment due for amortisation and interest, referred to in Articles 4 and 5, shall be made in accordance with the amounts of the schedule attached to this Agreement and fourteen days before their due dates. These payments shall be made by the Director-General to the Hongkong and Shanghai Banking Corporation in Shanghai in Shanghai sycee and/or coin of the national currency, as soon as the said currency shall have been effectively established, sufficient to meet such payments in Gold in London, exchange for which shall be settled with the Bank either on the date of payment or at the option of the Railway Administration at any date or dates within six months previous to any due date for the repayment of interest and principal. These payments may, however, be made in Gold fourteen days before their due, dates if the Chinese Government should happen to have

gold funds "bonafide" at their disposal in Europe not remitted from China for the purpose, and desire so to use them.

In reimbursement of expenses connected with the payment of the interest and repayment of principal of the loan, the Hongkong and Shanghai Banking Corporation will receive a commission of one quarter per cent. on the annual loan service.

ARTICLE 8

The Chinese Government hereby unconditionally guarantees that the interest and principal of this loan shall duly be paid in full, and should the revenues of the railway and/or the proceeds of the loan not be sufficient to provide for due and full payment of interest and repayment of principal, the Chinese Government will make arrangements to ensure that the amount of deficiency shall be met from other sources and handed over to the Hongkong and Shanghai Banking Corporation on the date upon which funds are required, to complete full payment of interest and repayment of principal.

ARTICLE 9

The loan shall be secured by mortgage of the railway declared to be now entered into in equity by virtue of this agreement, and shall, as soon as possible hereafter be secured by a specific and legal first mortgage in favour of the Company upon all lands, materials, rolling stock, buildings property and premises of every description purchased or to be purchased for the railway, and on the railway itself, as and when constructed, and on the revenues of all descriptions derivable therefrom.

The provisions of this Article in respect of the mortgage are to be construed and treated as equivalent in purport and effect to a mortgage customarily executed in England.

ARTICLE 10

The Company is hereby authorised to issue to the subscribers to the loan bonds for the total amount of the loan for such amounts as may appear advisable to the Company. The form of the bonds shall be settled by the Company in consultation with the Director-General or the Chinese Minister in London. The bonds shall be printed or engraved in Chinese and English; they shall bear the facsimile of the signature of the Director-General and of his seal of office, in order to dispense with the necessity of signing them all in person. But the Chinese Minister in London shall previous to the issue of any bonds, put his seal upon each bond with a facsimile of his signature, as a proof that the issue and sale of the bonds are duly authorised by, and binding upon, the Chinese Government, and the representative of the Company in London shall countersign the bonds as agents for the issue of the loan.

In the event of bonds issued for this loan being lost, stolen or destroyed, the Company shall immediately notify the Director-General and the Chinese Minister in London, who shall authorise the Company to insert an advertisement in the public newspapers notifying that payment of the same has been stopped and to take such other steps as may appear advisable or necessary according to the laws and customs of the country concerned, and should such bonds not be recovered after a lapse of time to be fixed by the Company, the Director-General or the Chinese Minister in London shall seal and execute duplicate bonds for a like amount and hand them to the Company, by whom all expenses in connection therewith shall be defrayed

ARTICLE 11

All bonds and coupons and payments of interest and repayments of principal in connection with the service of the loan shall be exempt from all Chinese taxes and imposts during the currency of this loan.

ARTICLE 12

All details necessary for the prospectus and connected with the payment of interest and repayment of the principal of this loan, not herein explicitly provided for shall be left to the arrangement of the Company in consultation with the Chinese Minister in London. The Company is hereby authorised to issue through its Agents the Hongkong and Shanghai Banking Corporation the prospectus of the loan as soon as possible after the signing of this agreement (subject to the provision stated in Article 13 below by several series) and the Chinese Government will instruct the Chinese Minister in London to co-operate with the Company in any matters requiring conjoint action and to sign the prospectus of the loan.

ARTICLE 13

The loan shall be issued to the public in two or more series of bonds to the amount of three million pounds sterling (£3,000,000) as soon as possible after the signature of this agreement, subject always to the engagement of the Chinese Government under Article 13 of the Chinese Government Reorganisation Gold Loan of April 26, 1913.

The price of the bonds to the Chinese Government shall be the actual price of issue to the public in London less flotation charges of five and a half points (5½) retainable by the company (that is to say a charge of Five Pounds Ten Shillings (£5.10/—) for every £100 bond issued).

ARTICLE 14

The proceeds of the loan shall be paid to the credit of a Pukou-Sinyang Railway Account with the Hongkong and Shanghai Banking Corporation in London. Payments of loan proceeds into the credit of this account shall be made in instalments and on dates conforming to the conditions allowed to the subscribers to the loan. Interest at the rate of three (3) per cent. per annum shall be granted on the credit balance of the portion of this account kept in London and interest on the credit balance of the portion transferred to China will be allowed at the Bank's usual rates for such accounts. After deduction of the funds required for the service of interest and for commission on this service during the time of construction, the Bank will hold the net proceeds with accrued interest to the order of the Director-General who in authorising the payment of any sums exceeding £20,000 shall give notice to the Hongkong and Shanghai Banking Corporation ten days before the day on which they are required. Requisitions on the loan funds will be drawn in amounts to suit the progress of construction of the railway by orders on the Hongkong and Shanghai Banking Corporation signed by the Managing Director or his duly authorised representative and the Chief Accountant, and accompanied by a certificate stating the nature and cost of the work to be paid for.

Funds to meet monthly estimates of construction expenses shall be transferred to Shanghai as and when required by order of the Director-General, such transfers being effected through the Hongkong and Shanghai Banking Corporation, and the transferred funds shall remain on deposit with this Bank until required for railway purposes.

The accounts of the railway will be kept in Chinese and English, in accordance with the accepted modern methods, under the direction of a duly qualified British Chief Accountant to be chosen and appointed by the Director-General with the previous consent of the Company. The terms of his agreement will be fixed by the Director-General. The Chief Accountant will draw up a list of the necessary staff for his Department for submission to the Director-General, who shall decide and make the appointments, and the Chief Accountant shall have sole charge under the authority of the Director-General and/or the Managing Director or his Representative of all disbursements and receipts of railway funds during the currency of this loan, and shall sign, in conjunction with the Managing Director, all documents appertaining to the disbursements of railway funds. The Railway Administration will publish annually upon the close of its financial year a report in the English and Chinese languages showing the working accounts and traffic receipts of the railway, which report shall be procurable by the public on application.

ARTICLE 15

If during the time of construction the net proceeds of the present loan with accrued interest should, after deduction of the sums necessary for the service of interest on the loan, not be sufficient to complete the construction and equipment of the railway line, the amount of deficiency shall be provided, in the first place, from such Chinese funds as may be available so as to permit of the uninterrupted continuance of the work of construction, any balance then uncovered being supplemented by a further foreign loan for the amount required, to be issued by the Company. The interest and other conditions of such supplementary loan to be the same as in the present agreement.

If after the completion of the line there should be a balance at credit of the railway account, such unused balance will be transferred to the credit of the interest reserve fund hereinafter mentioned in Article 17 as a provision for payments for which the Chinese Government is responsible under this agreement.

ARTICLE 16

The construction and control of the railway shall be vested entirely in the Chinese Government. The Chinese Government will appoint a Director-General of the Railway, who will reside in the immediate neighbourhood of the line, and have full power to act in the name and on behalf of the Government within the terms of the present agreement. The Engineer-in-Chief who will be chosen and appointed by the Director-General with the previous consent of the Company, shall be a duly qualified British Engineer and shall take orders from the Director-General, the Managing Director or his duly authorised representative. The terms of his agreement will be fixed by the Director-General. His duties will be to make the survey, draw up the plans of the line and make estimates, to direct the execution of the works and to order under the authority of the Director-General, the Managing Director or his duly authorised representative, all the materials and equipment necessary for the exploitation of the

railway. He will draw up a list of the necessary Chinese and foreign Engineering Staff for submission to the Director-General, and the latter shall appoint and send them to the Engineer-in-Chief, who shall then assign works to them. Whenever appointments of technical employés, both Chinese and foreign, are to be made or their functions defined, as well as in the case of their dismissal, the Engineer-in-Chief shall be empowered to take the necessary action by the Director-General, the Managing Director or his representative.

As and when any section of the line is constructed and ready for traffic it will be handed over by the Engineer-in-Chief to the Director General, who will, as far as circumstances permit, open such section to traffic, and will select a duly qualified British Traffic Manager, who will be charged with the operation of the railway under the order of the Director-General and/or the Managing Director or his Representative.

When the work of construction is entirely completed the service of the Engineer-in-Chief will terminate and the Director General will select a duly qualified British Engineer for the maintenance of the railway under the orders of the Director General and/or the Managing Director or his representative.

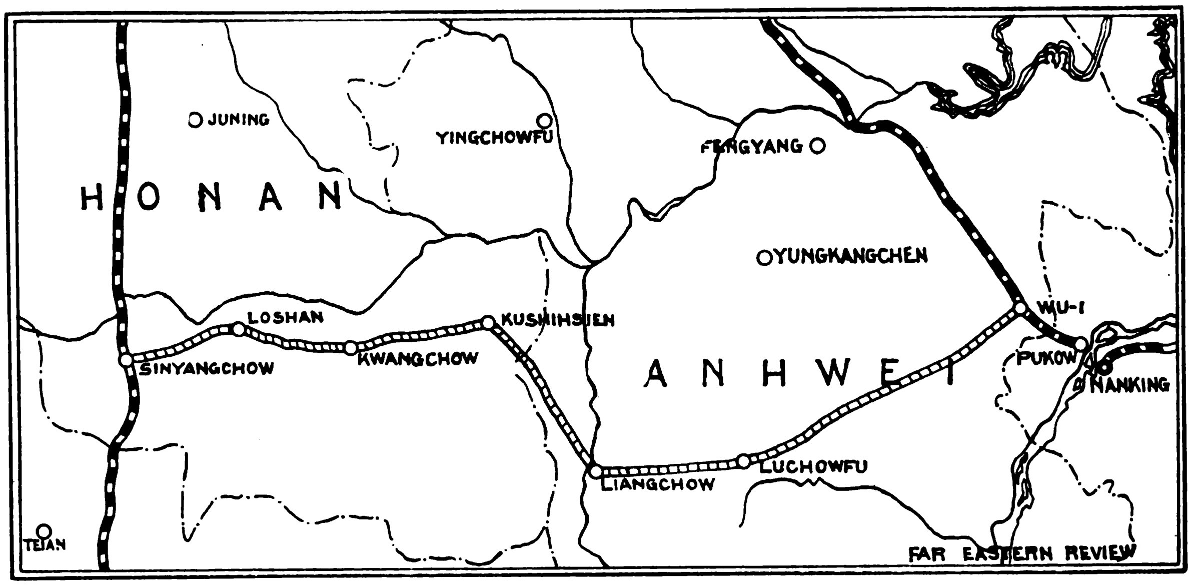
The two officers above referred to shall be appointed by the Director-General with the previous consent of the Company, and the Director-General shall fix the terms of their agreements.

ARTICLE 17

All receipts and earnings of the railway shall be regularly paid into the Railway's account with the Hongkong and Shanghai Banking Corporation, interest on such funds being allowed by the Bank at rates to be arranged for current account or fixed deposit as the case may be.

All expenses of working and maintaining the line shall be paid from the receipts and earnings, and any remainder thereof shall be charged with the service of the loan. If, after payment of these expenses, and making due provision for payment of interest on the bonds, and for repayments of principal due in accordance with the amortisation schedule hereto attached, there remain surplus funds unappropriated and properly available for other purposes, such funds shall be at the disposal of the Chinese Government to be used in such manner as the Director-General may decide, provided always that after completion and opening of the line to traffic the amount sufficient for regular payments of interest and repayment of principal shall be deducted from such surplus funds, if any, and shall be deposited with the Hongkong and Shanghai Banking Corporation six months before the date on which such payments fall due.

In the event of there being no surplus funds available as aforesaid from the earnings of the railway the amount required for payments of interest and repayments of principal shall be provided in accordance with the conditions of Article 8 hereinbefore.



ROUTE OF THE PUKOW-SINYANG RAILWAY.—In a map published in our November issue we inadvertently showed the route running due north from Liuanchow to Chengyangkwan. This map shows the real route.

ARTICLE 18

The Company will act as Agents of the Railway Administration during construction for the purchase of all materials, plant and goods required to be imported from abroad. For all important purchase of such materials tenders shall be called for by the Director-General; in the case of all tenders indents and orders for the importation of goods and materials from abroad, the said Agents shall purchase the materials required on the terms most advantageous to the railway, and shall charge the original net cost of the same, plus a commission of five per cent. It is understood that no orders for materials shall be executed or any expenditure incurred without the approval of the Director-General, to whom the Engineer-in-Chief shall apply for sanction.

In return for payment of commission as above stated the Company shall be prepared to superintend the purchase of all foreign materials required for the construction and equipment of the railway, which shall be purchased in the open market at the lowest rate obtainable, it being understood that all such materials shall be of good and satisfactory quality, and that the Railway Administration shall have the right to reject on arrival in China materials which do not come up to specifications. At equal rates and qualities goods of British manufacture shall be given preference over other goods of foreign origin.

Original invoices and inspectors' certificates are to be submitted to the Railway Administration; all return commissions and rebates of every description shall be credited to the railway, and all purchases made by the Agents, on behalf of the Railway, shall be supported by manufacturers' original invoices and inspector's certificates.

No commission shall be paid to the Agents except as above provided, but it is understood that the Railway Administration shall provide out of railway funds for the remuneration of Consulting Engineers, whenever their services are engaged.

With a view to the encouragement of Chinese industries preference will be given, at equal prices and qualities, over British or other foreign goods, to Chinese materials and goods manufactured in China. No commission will be paid to the Company on purchases of such materials and goods.

It is understood and agreed that after completion of construction of the railway the Company will be given the preference for such agency business, during the currency of the loan, for the supply of foreign materials as the Railway Administration may require, on terms to be hereafter mutually agreed upon.

ARTICLE 19

Branch lines or extensions in connection with the railway line mentioned in this agreement that may appear to the Chinese Government profitable or necessary later on shall be built by the Chinese Government with funds at their disposal from Chinese sources, and, if foreign capital is required, preference will be given to the Company. The length of such branch lines or extensions, shall be determined by the Chinese Government.

ARTICLE 20

The Company is hereby appointed Trustees for the bondholders, and in any future negotiations respecting this loan or matters arising in connection therewith, which may take place between the Railway Administration and the Company, the latter shall be taken as representing the bondholders and as empowered to act on their behalf.

ARTICLE 21

If, after the signature of this agreement and before the publication of the prospectus for the issue of the loan, any political or financial crisis should take place by which the market and the prices of existing Chinese Government stocks are so affected, as to render, in the opinion of the Company, the successful issue of the loan impossible on the terms herein named, the Company shall be granted a reasonable extension of time to be mutually agreed upon for the performance of their contract. If within the time limit then determined the loan shall not have been

issued, then this contract shall become null and void, and any advances made by the Company under the provision of Article a of this Agreement shall be repaid by the Chinese Government with accrued interest, but without any other compensation or remuneration whatsoever.

ARTICLE 22

By the preliminary agreement dated January 6th, 1899, it was stipulated that the terms and conditions of the present agreement should be subject to the terms and conditions contained in the final agreement for the Shanghai-Nanking Railway.

Article 12 of the said final agreement for the Shanghai-Nanking Railway provides for the participation by the lenders in the net profits of the railway after certain charges have been met, to the extent of 20 %, and net profit certificates were issued to the lenders to the amount of 20 % of the nominal capital of the loan.

It is hereby mutually agreed that in consideration of the Company waiving its rights under the aforesaid preliminary agreement it shall be granted the right to retain, in commutation of this participation in net profits £120,000 out of the proceeds of the loan in instalments and on dates in proportion to, and based on, the terms of subscription to the loan, as stated in the prospectus. No further payment in respect of commutation of profits will be allowed on any supplementary loans.

ARTICLE 23

The Company may, subject to all its obligations under this agreement transfer or delegate all or any of its rights, powers and discretions thereunder to any British Company Directors or Agents with power of further transfer and sub-delegation; such transfer, sub-transfer, delegation or sub-delegation to be subject to the approval of the Director-General.

ARTICLE 24

This loan is contracted after having been passed by the National Assembly under the authority of a Presidential order, dated the 14th day of November 1913, Western Calendar, which has been officially communicated to the Minister of Great Britain, in Peking, by the Waichiaopu.

ARTICLE 25

Four sets of this Agreement are executed in Chinese and English, three sets to be retained by the Chinese Government and one set by the Company.

In the event of any doubt arising regarding the interpretation of the contract the English text shall rule.

Signed at Peking by the contracting parties this 14th day of the eleventh month of the 2nd year of the Chinese Republic, corresponding to the fourteenth day of November, 1913, Western Calendar.

Signed by

HSIUNG HSI-LING, Minister of Finance.
(Seal)

CHOW TZE-CHI, Minister of Communications.
(Seal)

SHEN YUN-PEI,
For Chinese Central Railways Limited,
S. F. MAYERS.

THE ACTIVITIES OF THE PEKING SYNDICATE

The following is in reference to the report of the Pekin Syndicate:—

It is some 16 years since the Peking Syndicate was formed with concessions over great areas of rich mineral lands in Shansi and Honan, and another annual report shows that the undertaking is still in what is known as the development stage. The high hopes formed at the inception of the enterprise under influential auspices have been deferred again and again by adverse circumstances, not the least of which has been the attitude of the provincial authorities, culminating about six years ago in the retrocession of the Shansi concession.

MR. LAO CHU CHANG, Managing Director of the Pukow-Sinyang Railway

So far the main business of the directors has been the development of the coalfield in Honan, and up to June 30, 1913, the date of the balance-sheet now issued, a net sum of £600,000 had been expended on this property, after deducting the receipts from the sales of coal. In their report this year the directors explain briefly the original plans of the former board for the establishment of the Ja-mei-sen Mines and indicate how the completion of this program has been delayed by unavoidable circumstances. Not least among these adverse circumstances have been the two separate inbursts of water during the financial year under review. In October, 1912, there was an inburst which was estimated to be at the rate of 190,000 gallons an hour and which reduced the output from two of the pits by 1,000 tons a day. In April this year there was an even greater inburst, entirely independent of the other, and the output from the part of the colliery affected by this second influx was reduced by 500 tons. However, the year's total output of 402,451 tons from the whole colliery was only 67,687 tons less than that for the preceding year so that is obvious that but for the inbursts of water the total production of coal would have shown a substantial increase.

Dwindling Cost of Development

Besides diminishing the output, this latest water trouble has, of course, retarded development and necessitates the installation of additional pumping plant. The year's expenditure on the coalfields, after deducting the proceeds of the sales of coal, amounted to £27,036. This compares with £52,222 for the preceding year. The directors state that if some £15,000 had not been spent on the unwatering of the pits the item would have been reduced still further to about £12,000, and they deduce from this the conclusion that but for the inbursts of water the development stage at the Ja-mei-sen Mines would already have been completed. As regards the time when this happy consummation will now be reached the report goes no farther than to say that "when the development equipment of No. 3 pit is completed and No. 1 pit is in working order, the capital account at Ja-mei-sen Colliery may be closed and the revenue account opened."

As to the syndicate's railway interests, the report points out that the Chinese Central Railway Company, in which the syndicate has an interest of about one-fifth, has recently resumed its former activities, and has already obtained the concession of the Sinyang-Pukow Railway against a loan of three millions sterling. The directors express the hope that the industrial era that appears to be rising in China will secure a considerable profit on portion of the syndicate's capital invested in this company.

New Bank's Big Contract

An important extension of the syndicate's operations has been its recent participation in the establishment of the Banque Industrielle de Chine, by means of which the directors hope to achieve a better apportionment of the syndicate's capital between banking, mining, and railway interests. Moreover the close connection of this British company with a French Bank whose chief shareholder is the Chinese Government should create a system of co-operation and profit sharing between the capitalists of both countries and the Chinese officials, and should prove advantageous to all three parties. The manner in which the syndicate has raised the funds to subscribe for its holding of 1,000 Founders' shares and 15,350 Ordinary shares is not indicated, the bank being established a few days after the date to which the Peking Syndicate accounts are made up. An important example of the class of transaction into which the new bank is entering is given in the report. The Chinese authorities have recently decided to establish a thoroughly-equipped up-to-date port at Pukow, adjoining which the syndicate has extensive lands. The works are to be entrusted to the new bank, a contract having been signed between the bank and the Chinese Government for a loan of £6,000,000, out of the proceeds of which the works will be first taken in hand. These works will naturally increase the value of the syndicate's land in the vicinity.

For its current revenue the syndicate relies mainly on the income from its holding of £800,000 of the Chinese Government Honan Railway Five per Cent. Gold Loan of 1905. After adding sundry revenue and deducting administration expenditure there is a balance of £17,815 for the year, against £28,168 for the preceding year. The balance again goes to swell the accumulated credit balance of the profit and loss account, which now amounts to £458,258. But the principal change in the balance-sheet is the appearance among the liabilities of a loan of £150,000 from bankers against securities. On the assets side the proceeds of this loan are represented mainly by increases of £55,000 in "investments" and £78,000 in "shares in other companils and syndicate participations;" these two items amounting at June 30 to £218,857 and £98,664 respectively. The cash balances, too, at £76,853, are about £28,000 larger than last year, but £17,000 of the increase is attributable to a decrease of that amount in the stocks of coal. The principal other items on the assets side consist of £733,511 in respect of the Government bonds; the £600,000 of coalfield expenditure, to which we have already referred; £133,732 representing the amount apportioned to the Honan concession; and £42,108 for the syndicate's steam collier.

Share Quotation Anomaly

The issued capital has remained, of course at £1,242,822 in three classes of shares. The market quotations for the Ordinary and Shansi shares are still strangely at variance with their comparative intrinsic values. In 1910 the rights of the different shares with regard to dividends and capital were definitely determined and by examining the effect of the somewhat complicated regulations then laid down it is possible clearly to bring out the remarkable discrepancy. The effect of these regulations is that by the distribution of the first £88,666 of profit the Shansi shares would receive 9¾d. per share, while the Ordinary would receive 2s. per share. The next £2,098,282 of profit distributed would give 19s. 2¼d. per Shansi share and £1 3s. 8d. per Ordinary share, and each succeeding £100,000 10d. per Shansi share and 1s. 3d. per Ordinary share. It is obvious from this that the dividend per Ordinary share will throughout be substantially greater than that per Shansi share. Yet the Ordinary shares are quoted at $\frac{7}{16}$, and the Shansi at 1⅛. In the course of the various wide fluctuations that have occurred in the shares the discrepancy lessens from time to time, but at present it is remarkably large. The only explanation that can be adduced is the fact that the Shansi shares are more closely held and are therefore less liable to acute depression, such as the recent political condition of China has caused in the Ordinary shares.

It is obvious that the shareholders will still have to wait some years before they receive what can be regarded as an adequate return on their capital after the long period without dividends. The directors express confidence that the syndicate's policy will sooner or later produce a large and steady profit on the capital. How soon this desirable stage is reached depends, among other things, on the attitude of the Chinese authorities, and the report is quite reassuring in this respect. It states that even before the establishment of the Banque Industrielle de Chine, which has made the former connection closer, the syndicate has had many reasons to be satisfied with the friendly attitude of the Chinese officials regarding its Honan properties, while, quite recently, encroachments by some of the Honan people on the company's area have been prevented by order of the authorities.

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CAPITAL IN THE PHILIPPINES.

A most important pronouncement of policy in regard to capital invested in the development of the Philippines Islands has been made by the Governor-General, Mr. Francis Burton Harrison. Capital which goes to the Philippines for business, and which does not concern itself with politics is assured of a hearty welcome, declares Mr. Harrison, and he adds that the Government will do everything it legitimately can to protect the interests of investors. This statement, the importance of which cannot be over-estimated, was made in connection with the concession granted early in January to the Kolambugan Lumber Company over 150 square miles of territory in Mindanao.

All those whose interests are bound up in the Philippines will welcome this timely declaration by the Governor-General. There is an unlimited field for the profitable investment of capital in the Islands. Capital, is, however, proverbially timid and there has been some hesitation manifested in taking advantage of the opportunities that offered. Fear was felt that the attitude of the Administration might not be sympathetic. Mr. Harrison has shown that these fears are groundless. Moreover he has demonstrated that his policy is broadly based. The Kolambugan Lumber Company is a British concern. Foreign as well as American capital devoted to the legitimate development of the Islands will be welcomed and protected. This pronouncement should have a most beneficent influence and it may be expected with confidence that more capital will now seek investment in the Philippines with the result that there will be a widening field of employment for the Filipinos and a healthy reaction upon the finances of the possession.

CHINA'S MINING DISTRICTS

The Minister of Commerce and Industry is pushing forward proposals for the development of mining, and has placed before the Cabinet a scheme for the division of the country into eight mining districts to be controlled by the Mining Supervision Bureau. If this scheme is adopted one superintendent will be appointed to control each of seven divisions, the one comprising the provinces of Chihli, Shantung, Shansi, and Honan coming directly under the Ministry of Commerce and Industry. The headquarters of the second division will be at Changchun, on the South Manchurian railway, and the regions under the superintendent stationed there will be Fengtien, Kirin, and Heilungkiang. The third district will be composed of the provinces of Anhui, Kiangsu, and Chekiang, with headquarters at Nanking, while the fourth district will be Hupeh, Hunan, and Kiangsi, with headquarters at Changsha. The fifth division will be Shensi, Kansu, and Singkiang, with headquarters at Changan; the sixth will be Kwangtung, Kwangsi, and Fukien, with headquarters at Canton; the seventh will be Yunnan and Kweichow, with headquarters at Kunming, in Yunnan; and the eighth will be Szechuan alone, with headquarters at Chengtu. It is proposed to engage experts to prospect the areas, make analyses and survey mineral fields, while regulations will be devised to regulate certain aspects of operation with a view to the protection of the lives and safety of miners. The Bureaux will supervise the granting and withdrawal of mining rights, the collection of mining taxes, the encouragement of development, etc. The promulgation of mining regulations is being eagerly awaited by many who have potentially rich deposits in view for development, and if the old official harrassment is abolished, and the provisions for the introduction of foreign capital are liberal, as the Minister for Commerce and Industry assured us they would be, there should be witnessed in the near future a considerable improvement in the mining industry. Railways are being pushed out into regions where large deposits of varying minerals exist, and the only thing that now retards proper and scientific development is the lack of laws which will safeguard foreign capital. Once laws giving security to investments are enacted there will be a quick response on the part of capitalists, and many localities already ear-marked will be the scenes of activity.

OPEN PORTS IN NORTH CHINA

Early in January the Chinese Government spontaneously opened to foreign trade seven towns in North China. These were:—Kweiwacheng in Shansi; Chihfeng, Kalgan and Dolonor in Chihli, Lungkow in Shantung, Taonanfu in Western Shengking and Kulutao, the new port under construction in south-western Shengking. It is evident that the object in view is to preserve China's interests in the region that is threatened with the dominance of Russia and Japan, though it may be unfair not to credit the Chinese Government with the realization that the encouragement of foreign trade is *per se* well worthy of its attention. There is some difference of opinion in regard to the value of the opportunities afforded to foreign trade by the opening of these cities, and the view is widely held that political rather than economic considerations dictated the step. Still, it may be conceded that, in principle, the more places in China that are opened for foreign trade the better both for China and for the foreign merchant. During the regime of the Provisional Government at Nanking it was understood that eventually the whole country would be thrown open to unrestricted trade, residence and travel. If that could be brought about China would undoubtedly move forward at a greatly accelerated pace.

If any considerable international trade were to be established at the five new open ports outside the Great Wall, there is no doubt that China's hold upon Inner Mongolia would be greatly strengthened. The question arises, however, whether the expedient has not been adopted too late. Japan recently acquired the right to construct for China a railway running from Taonanfu to Jehol, amongst others. This will extend Japanese influence considerably farther westward than heretofore, and the idea of consolidating China's power in Inner Mongolia by building lines from Peking to Jehol, from Jehol to Chihfeng, and from Chihfeng to Dolonor must be weighed with due recognition of Japan's consolidated position. If these lines are to be constructed the question is by whom? Great Britain by the Notes exchanged with Russia in 1899 cannot seek "any railway concessions to the north of the Great Wall of China." There would be a certain amount of cynical humour in the position if the Belgians or French, whose close association with Russia is fully set out in a lengthy article elsewhere, were to be entrusted with the task of buildings railways to preserve China's rights in Inner Mongolia. Disinterested observers will lament the absence of the American Group and the apparent cessation of active interest by the State Department at Washington in Chinese affairs. At this juncture practical and sympathetic assistance in reference to the Mongolian question would be of incalculable value to China and would at the same time greatly benefit American interests.

ENCOURAGEMENT OF CHINESE INDUSTRIES

If the professions of the various Ministers of the Peking Cabinet are to be taken as a criterion there is to be an industrial boom in China. On all possible occasions, in Presidential Mandates, in speeches, and interviews with correspondents, they take the fullest advantage of the opportunity to stress the fact that they realise to the full that upon industrial development, and the expansion of means of communication, depend the progress of the country. No words are minced in the endeavor to convince the possible sceptic that they intend ceaselessly to keep their shoulders to what has always been in the past a Sisyphian stone, and if Presidential Mandates, which focus these intentions, are of value, then we are on the eve of important developments. Already we have reported the hopes of the Minister of Commerce and Agriculture with respect to mining; in this issue we deal with the creation of the Irrigation and Conservation Bureau; there have been placed before the Government for adoption definite proposals for currency reform, and already regulations have been issued for the encouragement of Chinese commercial enterprises. These regulations create what is called an "Interest Guarantee Fund," or "a Paohsi Fund," to give the Chinese title. It provides for the setting apart by the Government of a sum of $20,000,000 in Government bonds to be used "as an endowment for the Interest Guarantee Fund," the annual interest of which may be advanced to companies of what is called the first class, such as "cotton textile, woollen textile and iron works industries," and companies of the second class such as "silk, tea, and sugar factories," so that the "interest of the shares of the companies may be secured and guaranteed." Any first class company may apply and register for the protection of the Interest Guarantee Fund to the amount of 6 per cent. of the actual paid up capital of the Company, and any second class company to the amount of 5 per cent. Only new Chinese companies organised under Chinese laws may receive guarantees, and then only in the case of first-class companies if their paid-up capital is not less than $700,000, and second-class if the paid-up capital is not less than $200,000. The privilege of the guarantee is to be limited to three years from the date when manufacture begins, and commencing with the sixth year after the first receipt of the guarantee the recipient company must repay one-twenty-fourth of the total received every year. Regulations make provision for cases of failure or fraud or various vicissitudes, and the management of the scheme is in the hands of the Bank of China. The Minister of Finance (Mr. Hsiung Hsih-ling) and the Minister of Commerce and Agriculture (Mr. Chang Chien), both of whom have had considerable experience with Chinese industries, are responsible for the presentation of the scheme, the regulations of which came into force on the date of promulgation on January 13. In promulgating the regulations the President made the comment that, "a careful perusal of these regulations will show that they have been well drawn up, and therefore they are hereby approved."

CHINA REVISES HER BUDGET.

Early in January the Minister of Finance issued a revised Budget showing a deficit of $84,940,731, as against that of the previous statement of $70,000,000. The Budget prepared last year was found to contain what are described as "defects," and in a statement by the Minister of Finance it is explained that finances have been seriously affected by the state of rebellion in the country, which not only impoverished the people, but likewise prevented the disbandment of troops. The former Cabinet estimated the military expenditure for the whole country at $130,000,000 for the upkeep of fifty divisions of Luchun, while the amount to be saved by the disbandment of superfluous troops in the provinces was fixed at $27,000,000. That disbandment was not, of course, effected. It was estimated, too, that the Government could raise $120,000,000 by domestic loans, but again the aftermath of the rebellion interfered and the bonds could not be sold. As the Finance Minister aptly says, the making of estimates "is like drawing a pudding on a piece of paper. It looks like one but fails to satisfy hunger." The Minister proposes that an effort should be made to improve affairs so that receipts and expenditure might be balanced. He urges that all "corrupt practices be done away with;" that economy be studied; that the provinces refrain from using loans to assist them to balance their accounts; and that all expenditure be met from income. The figures now prepared for the year from July, 1, 1913 to June 30, 1914, are: Total receipts $557,296,145, and total expenditure $642,236,876, made up as follows:

A.—Ordinary Receipts—Land Tax $79,180,722; Salt Tax 77,401,265; Customs Tax 66,970,003; Likin 32,704,806; Other Taxes 37,862,160; Other Duties 3,811,172; Public Property 7,849,612; Miscellaneous 12,385,813. Total 318,165,553.

B.—Extraordinary—Land Tax $3,222,888; Salt Tax 164,269; Customs Tax 1,254,280; Likin 6,054; Other Taxes 417; Other Duties 132,412; Public Property 634,093; Miscellaneous 10,115,871; Contributions 230,308; Public Loan 223,370,000. Total $239,130,592.

A.—Ordinary Expenditure—Ministry of Foreign Affairs $3,293,115; Ministry of Interior 39,618,149; Ministry of Finance 210,345,180; Ministry of Education 5,207,215; Ministry of War 136,864,494; Ministry of Navy 7,665,881; Ministry of Justice 14,671,825; Ministry of Agriculture and Commerce, 5,083,386; Ministry of Communications 934,877. Total $423,684,122.

B.—Extraordinary—Ministry of Foreign Affairs—$1,013,223; Ministry of Interior 4,263,860; Ministry of Finance 181,568,614; Ministry of Education 1,701,635; Ministry of War

26,910,518; Ministry of Navy 1,307,014; Ministry of Justice 370,312; Ministry of Agriculture and Commerce, 959,735; Ministry of Communications 457,843. Total $218,552,754.

A hopeful sign is the revival of the system of the provinces sending contributions to the Government, which is significant of the existence of better relations between the Central Government and the provinces. For a considerable time the provinces instead of remitting contributions to Peking demanded monetary aid. A semi-official statement shows the amounts remitted or promised to Peking by the provinces as follow:—

Kiangsu $1,000,000, which has been received.
Chekiang $200,000, which has been received.
Shantung $500,000, which has been received.
Kiangsi $800,000, of which $400,000 has been received.
Shansi $400,000, of which $200,000 has been received.
Kansu $100,000, which has not yet been received
Honan $300,000, which has not yet been received.

GOLD IN THE PHILIPPINES

Interesting Discovery by Bureau of Science

Another evidence of the value of careful records of the strata or rocks pierced in drilling artesian wells has lately come to light in the finding of gold in the rock cuttings submitted from a well drilled at Casiguran, Sorsogon, Philippine Islands. Through a special arrangement the Bureau of Public Works submits samples of the strata pierced by the well drilled by them to the Bureau of Science where the cuttings are examined by the geologists and a record is filed showing the character of the rocks encountered. Recently, stratification samples from well 537, lately completed by the Bureau of Public Works for the town of Casiguran, Sorsogon, were received by the Bureau of Science. An examination revealed considerable mineralization in the samples of cuttings submitted as representative of the rocks encountered between 250 and 300 feet in depth. This sample was panned and a number of small pieces of gold or "colors" were obtained. A duplicate assay on the crushed samples showed a value of pesos 5.30 remaining after part of the gold had been removed by panning. While the quantity of cuttings received is too small to yield a representative sample, the rock is unquestionably gold-bearing.

For various reasons driller's samples do not always fairly represent the formation throughout the depth which is marked on the sample sacks. This possible irregularity must be considered in estimating the importance of the discovery of gold in the sample submitted. On the other hand, the Bureau of Science has no reason for suspecting that the samples received in this case are not representative. Certainly the stratification samples received check very well with the record of the drilling contained in the driller's original log, as will be apparent from the following comparison.

The well in question is 520 feet deep and supplies 20 gallons of water per minute by pumping. Casiguran is located on an alluvial plain just above sea level on the southern shore of Sorsogon Bay. Immediately behind the town are hills and spurs of basaltic to andesitic flows, tuffs, and breccias which form the northern slopes of the volcano, Mount Bulusan. The driller's log shows the first 60 feet of the well to be in yellow "sand and clay, very soft." Sample 1, received by the Bureau of Science is marked "0 to 60 feet" and is stiff, sandy clay. The driller's log describes the material encountered from 60 feet in depth to the bottom of the well all as "sand." The cuttings for each 10 to 20 feet, are recorded, usually simply as "sand," or "dark and white sand." Sample 2 received by the Bureau of Science is marked from 60 to 250 feet, and consists of coarse to fine, sharp sand with both light and dark colored grains. Sample 3, 250 to 300 feet, is likewise a sand, but the character of the pieces lead to the belief that the sand results from the cutting action of the drill in solid rock. The sand contains pumice, obsidian, banded solica and pieces of a silica-impregnated felsite, carrying pyrite and other minerals. Samples 4, 5, 6, 7 and 8 representing the interval between 300 and 520 feet, appear to be original sands. The grains are principally of pumice, which is white and obsidian and basalt, which are black; consequently the sands are "light to dark" in color as noted by the driller.

While the driller's classification indicates a well in sand practically throughout its depth, his log shows that he was able to drill in advance of his casing from 249 to 300 feet, whereas at all other depths the casing was driven so as always to extend nearly or quite to the bottom of the well. This fact supports the idea suggested by the nature of the cuttings in sample 3: that is, that the material from 250 to 300 feet in depth in which the gold occurs stood up as solid rock.

Sample 3, 250 to 300 feet in depth, contains fragments of pumice, obsidian, basalt, and a falsitic to porphyritic light-colored rock. The light-colored rock is in part glassy but contains a few very small phenocrysts, some of which are light colored, probably feldspars, and others dark black in color, hornblende or possibly pyroxene. The rock fragments, both dark and light colored, contain pyrite and other minerals and appear to have been impregnated with silica, which may be seen with a banded structure in some of the fragments. The individual pieces in the cutting are too small to permit of close mineral determination.

The gold occurs free in part at least and is very fine. Some of it can be obtained by panning the cuttings—more readily after the latter have been crushed—and under the microscope the individual pieces are seen as minute, sharp-edged plates or laminae. Adhering to the gold and also in plates is a silvery white metallic mineral which is probably a telluride although a positive test for tellurides could not be obtained.

It appears that between 250 and 300 feet the well passed through the edge of a volcanic flow or fine volcanic breccia, which is intercalated with pumicious volcanic tuffs and some alluvial sands. The rock containing the gold has been impregnated with solutions carrying silica and other minerals.

Gold has never been reported from Casiguran, although the river gravels at Juban a few kilometers farther east are said to carry gold. The district has never yielded any gold, however, and the results of the examination of the drill cuttings of this well constitute a genuine discovery of gold.

THE MAT INDUSTRY IN THE PHILIPPINES

Few people realize the number of mats that are woven each year in the Philippines and how extensive the domestic commerce in them is. The "petate" or "banig" is made in towns here and there throughout the islands. In some places strips of the young buri palm leaf are used. In other towns the mats are woven from strips of pandan leaves. In the Visayan islands and Mindanao, a great many are made from the stalk of a sedge called tikug. The women in towns where mats are made add a considerable amount of money to the family income through the production and sale of petates.

The mats are bought up by traders and small merchants and are distributed by them throughout the islands. In many towns where materials suitable for mat making exist, mats are imported and are sold at prices several times greater than what they can be produced for locally. The bureau of education is introducing the art of mat weaving in such localities with considerable success. For instance, the weaving of tikug mats was introduced in the schools of Talocogon in Agusan province. This occurred about a year ago. Previous to that time no mats were made in the municipality and the people were supplied with mats imported from Samar. Now, enough petates are made to supply not only local needs but also for export in considerable quantity. The bureau of education also recognizes the value of Philippine mats for floor and wall decorations both in the Philippines and in the United States and is encouraging the production of decorated mats for this trade. The sabutan and tikug wear well on the floor. A store is now established in Manila which handles the latter mats exclusively.

One of the most decorative mats is that which comes from the island of Romblon. It has a very fine border which gives a lace effect and is an excellent background for mounting pictures and curios.

INDUSTRIAL DEVELOPMENT IN SHANTUNG

A Peking paper reports:—Mr. Fan Fu, Commissioner of Industry, Shantung, is working hard for the improvement and development of industry in the province. As soon as he took up the post, he published his policy for the industrial administration to be carried out in Shantung. Later, he established an organ called the "Shantung Industrial Magazine" and started to interest the public in the subject. His earnest efforts must have borne fruits, for recently the enthusiasm of the people has been stirred up, with the result that a number of industrial schemes is being contemplated.

One of them is the establishment of a spinning mill at Kaotang, a place famous for cotton production. A company has been organized there by a certain Cheu Wen-chang for the purpose of manufacturing cotton yarn with the local production. It is said that the first payment on the subscription of shares has been made. The capital is understood to be of a small amount, however.

Another project is restarting the work of the Tungchang Spinning Mill. It must be remembered that the factory was established some years ago, but owing to mismanagement was reduced to the state of suspension. An order is now issued by the authorities commanding the shareholders to resume the work. The matter being considered by the parties interested in the enterprise, something will be done toward the recommencing of operations.

Yenchow and Tsining producing tobacco, many are engaging in the manufacture of cigarettes. But as all of them are pursuing their business with small capital, prominent merchants of the districts are contemplating to organize a cigarette factory. A petition asking the authorities to give the promoters necessary permit is said to have already been presented to the Provincial Government.

A considerable quantity of tea is produced at Ningyan, Tzuyang, Taian and Raiwu. But petty competition among the local tea producers has prevented the industry to make any headway. With a view to ameliorate the evil, influential parties are working to establish a company by combining the producers so that the output can be marketed at a greater profit. An application for the necessary official grant is also said to have been filed.

REFORM OF CHINA'S CURRENCY

PROPOSED LEGALISATION OF A SILVER STANDARD

As last something is to be done with regard to China's currency. A law has been drafted establishing a silver standard with a unit of 72 candareens nine-tenths fine. Before this issue reaches the reader the law—which is herewith reproduced—will probably have come into effect.

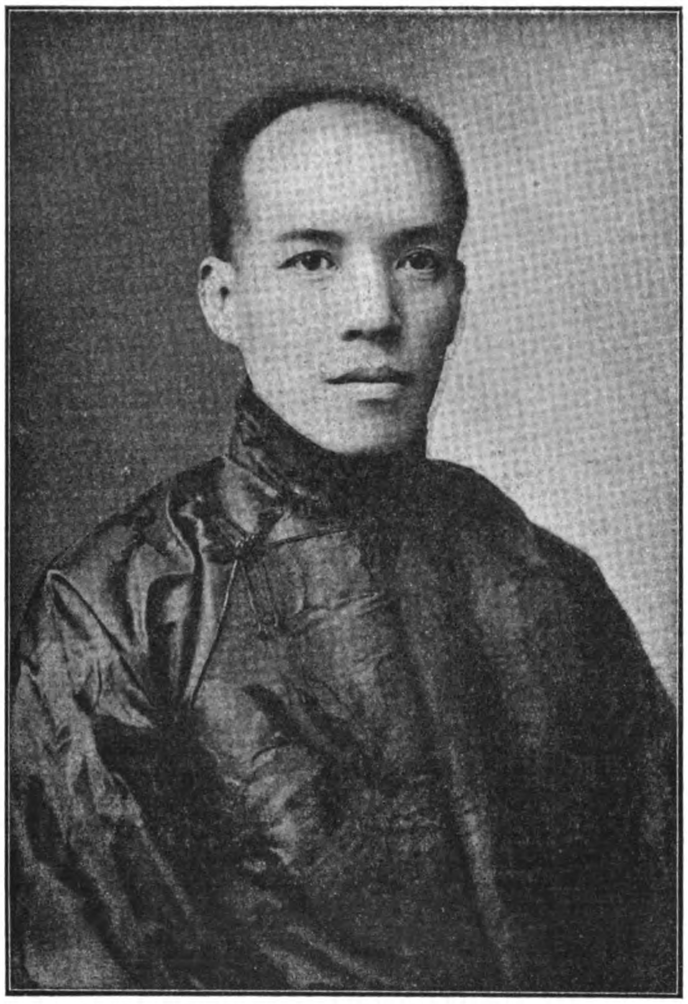
The higgledy-piggledy nature of the currency of China is one of the stumbling blocks to trade, and the efforts that have been made to bring about a substantial reform have from time to time been referred to in FAR EASTERN REVIEW. Briefly, the most substantial progress made towards some sort of finality was at the currency conferences held in 1911 at London, Paris, and Berlin, when Dr. Chen Chin-tao, Mr. Hsu Un-yuan, and Mr. Woo Nai-tsen represented China in discussions with representatives of the bankers of Great Britain, America, France and Germany, who were interested in the projected Currency Loan.

Dr. Chen Chin-tao presented to the conference the details of a proposal to unify the currency upon a silver basis, and after exhaustive discussion the scheme was approved by the Conference. Owing to the outbreak of the revolution towards the end of 1911 the proposals were not put into effect, and the development of ideas on the subject eventually brought about the appointment of a committee in the Ministry of Finance, in October, 1912, further to discuss the character of the standard which should be adopted. After 38 meetings that committee decided upon a gold exchange standard, but its recommendations—which were exclusively published in the FAR EASTERN REVIEW, in February, 1913,—were not adopted by the Government. In fact opposition rose to the gold-exchange standard, and advocates of a silver standard were able to make their voices heard with the result that in February, 1913, the President issued a Mandate appointing three commissioners, Messrs. Hsu Un-yuan, Daqueen Tao, and Wong Hung-U to make thorough investigations and discuss fully and seriously the questions of standard and unit and the methods to be adopted to carry out a reform. The result was not final, as different views were held as to the most advantageous standard, and in November, 1913, the Premier, Mr. Hsiung Hsih-ling, appointed another commission of which he was the Chairman, Mr. Liang Chih-chiao, the Vice-Chairman, and a membership composed of Mr. Tang, President of the Bank of China; the Director of the Mint; the Chief of the Currency Department of the Board of Finance, and Mr. Hsu Un-yuan, who had previously written a paper, published in the FAR EASTERN REVIEW, in May, 1913, advocating a silver standard. This Committee thoroughly discussed the whole question, and decided that a gold-exchange standard was not suited for China in her present condition. They brought forward the proposal for a silver standard with a unit of 72 candareens nine-tenths fine—similar to the currency now in circulation—and drafted the proposed laws which are herewith published. Their recommendations were discussed by the Cabinet and after several meetings a final discussion took place in the presence of the President when the proposed laws were agreed to. On January 17 they were placed before a conference of the members of the committee and the foreign advisers when the silver standard was unanimously agreed to, and, after a discussion in which a change of the unit was proposed, the unit of 72 candareens was also agreed to. The next step will be the promulgation of the laws by the President, unless the foreign bankers who are negotiating an agreement for the flotation of the currency loan, raise objections. As the silver standard was originally agreed to in the discussions held with the bankers in Europe it is hardly likely that questions will be raised now, unless there is some special motive for doing so.

MR. HSIUNG HSIH-LING, Premier and Minister of Finance.

Although the silver standard has been adopted the committee lays it down, and the Cabinet endorses the condition, that it is but a temporary measure, by reason of the fact that China must adopt the gold standard eventually. The silver standard is, they say, but a "ferry-boat" to reach the better standard later. A gold-exchange or gold standard is impossible at this period, and "some standard being better than none" it is prudent to adopt the silver standard to begin with. The gold standard cannot be adopted at this juncture, the committee explains, because the amount of gold in China is not enough to make gold coins for circulation; the cost of purchasing gold from abroad would be too heavy, and, furthermore, the amount of silver which would be left upon the hands of the country by purchasing gold "would cause a panic in the financial world." A potent argument is that "it is the temperament of the Chinese people to hoard precious metals, and if they see gold coins which are attractive they will keep them if they are financially able to do so," and thereby put them out of circulation.

The unit of 72 candareens with a nine-tenths fineness was fixed upon because "it is the most suitable from the standpoint of practicability." The people of the country have become accustomed to calculating the medium of exchange in the term of the dollar, and that dollar weighs 72 candareens. The weight has also been adopted by the mints of the country for many years. According to the report of the Ministry of Finance the dollars turned out by the various mints now amount to more than



MR. LIANG CHIH-CHIAO, Minister of Justice and Vice-Chairman of the last Currency Committee

200,000,000. It would, therefore, "be best to utilise the existing coins and employ them as reserves for exchange, so that during the period when the amount of new coins is not sufficient for general circulation there will be something which will act as substitutes." At the present rate of operation the mints of China can make but 500,000 dollars per day, and the committee calculate that the making of new moulds and improvement in machinery would take up so much time that it would be more than two years before they could mint 100,000,000 silver *yuans*, the name of the new coin. The 200,000,000 dollar coins now in circulation will be, therefore, useful while new coins are being made.

The scheme will be instituted first in the Treaty ports and afterwards in the interior.

The following is the text of the regulations devised by the committee and approved by the Cabinet and President:—

National Coinage Law

Art. 1. The rights of minting and of issuing the national coinage shall belong solely to Government.

Art. 2. The monetary unit shall be called the "Yuan" which shall contain six tsien (mace), four fen (candareen) and eight li of a k'uping tael or 23.97795048 grammes of pure silver.

Art. 3. The different coins shall be of the following kinds:

SILVER COINS, FOUR KINDS:

1. One Yuan coins.
2. Fifty-cent coins.
3. Twenty-cent coins.
4. Ten-cent coins.

NICKEL COIN, ONE KIND:

1. Five-cent coins.

COPPER COINS, FIVE KINDS:

1. Two-cent coins.
2. One-cent coins.
3. Five-mill coins.
4. Two-mill coins.
5. One-mill coins.

Art. 4. The National Coinage shall be based on the decimal system. One-tenth of a Yuan shall be called the "Choh" or dime; one-hundredth of a Yuan shall be called a "Fen" or cent; and one-thousandth of a Yuan shall be called a "Li" or mill. All exchanges public and private must be based on this.

Art. 5. The weight and fineness of the different coins shall be as follows:

1. One Yuan silver coins: the total weight of a one-Yuan coin shall be 7 tsien and 2 fen of a k'uping tael and its fineness shall be 90 per cent. silver and 10 per cent copper.
2. Fifty-cent silver coins: the total weight of one fifty-cent coin shall be 3 tsien, 2 fen and 4 li of a k'uping tael and its fineness shall be 70 per cent. silver and 30 per cent. copper.
3. Twenty-cent silver coins: the total weight of one twenty-cent coin shall be 1 tsien and 2 fen of a k'uping tael and its fineness shall be 70 per cent. silver and 30 per cent. copper.
4. Ten-cent silver coins: the total weight of one ten-cent coin shall be 6 fen of a k'uping tael and its fineness shall be 70 per cent. silver and 30 per cent. copper.
5. Five-cent Nickel coins: the total weight of a five-cent coin shall be 7 fen of a k'uping tael and its fineness shall be 25 per cent. nickel and 75 per cent. copper.
6. Two-cent copper coins: the total weight of one two-cent coin shall be 2 tsien and 8 fen of a k'uping tael and its fineness shall be 95 per cent. copper, 4 per cent. tin and 1 per cent. zinc.
7. One-cent copper coins: the total weight of one-cent coppes coin shall be 1 tsien and 8 fen of a k'uping tael and its finenesr shall be 95 per cent. copper, 4 per cent. tin and 1 per cent. zinc.
8. Five-mill copper coins: the total weight of one five-mill copper coin shall be 9 fen of a k'uping tael and its fineness shall be 95 per cent. copper, 4 per cent. tin and 1 per cent. zinc.
9. Two-mill copper coins: the total weight of one two-mill coin shall be 4 fen and 5 li of a k'uping tael and its fineness shall be 95 per cent. copper, 4 per cent tin and 1 per cent. zinc.
10. One-mill copper coins: the total weight of one one-mill coin shall be 2 fen and 5 li of a k'uping tael and its fineness shall be 95 per cent. copper, 4 per cent. tin and 1 per cent. zinc.

Art. 6. The standard silver Yuan shall be legal tender to any amount in any one payment.

The fifty-cent silver coin shall be legal tender up to 20 Yuans worth in any one payment.

The twenty-cent and ten-cent silver coins shall be legal tender up to 5 Yuans worth in any one payment.

The nickel and copper coins shall be legal tender up to one Yuan worth in any one payment.

The above limitations are not applicable in the payment of taxes to the Government and in the exchange of coins at the Governme t Bank.

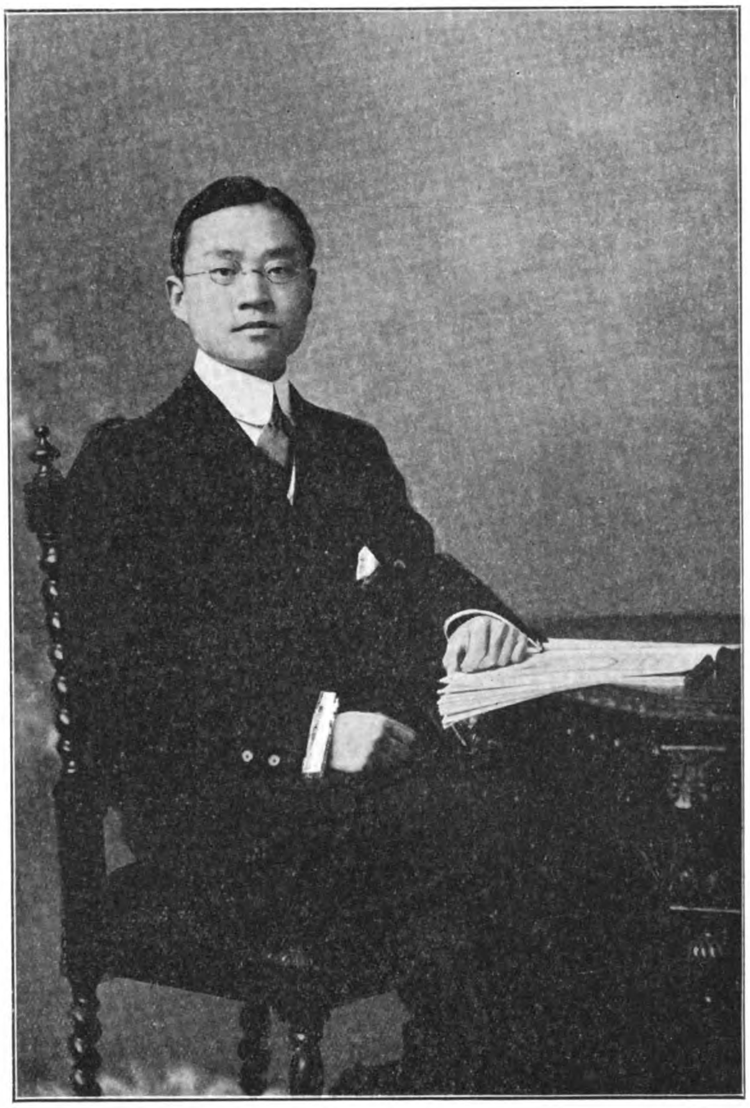
Art. 7. The designs of the national coins shall be decided and proclaimed by Preside.tial Order.

Art. 8. The weight of a silver coin of any denominati n shall not differ from its prescribed legal weight by more than 3/1000. One thousand of any of the silver coins of the same denomination weighed together shall not differ from their total legal weight by more than 3/10000.

Art. 9. The fineness of any of the silver coins of any denomination shall not d ff r from its prescribed legal standard of fineness by more than 3/1000.

Art. 10. When a silver Yuan has been reduced in weight by natural abrasion through use to the extent of one per cent. of its

DR. CHEN CHIU-TAO, China's foremost authority on currency questions and at present China's representative in Europe on financial matters.



MR. HSU UN-YUAN, Director of the Department of Trade, Currency, Banking and Public Loans.

prescribed legal weight, and when any of the subsidiary coins, whether of silver, nickel or copper has been so reduced in weight to the extent of 5 per cent. of its legal weight, they may be taken to the Government Offices to be exchanged for new coins according to their face value.

Art. 11. No one shall be compelled to accept any coin which has been intentionally and fraudulently defaced or mutilated.

Art. 12. The Government must coin in the form of Yuan for all those who may tender silver bullion at a charge of 6 li of a k'uping tael per Yuan.

Art. 13. The date when the above regulations shall come into force shall be decided and proclaimed by Presidential Order.

SPECIAL REGULATIONS FOR THE EXECUTION OF THE NATIONAL COINAGE LAW

Art. 1. All officiat receipts and disbursements shall be made in the national coinage, except those specially exempted by the present Regulations.

Art. 2. The Government shall exchange all old dollars with the national coinage in order to have the former re-minted. But within a certain period the old dollars may continue to circulate and will be considered to have the same value as the new Yuans. The said period shall be decided and proclaimed by Presidential Order.

Art. 3. All the silver and copper cash shall be withdrawn by the Government with the National coinage so as to have them re-minted, but within a certain period, they may continue to circulate at their market value. The public offices at different localities shall publish a monthly market rate of the old coins at which all official receipts shall be made. The monthly rate shall be made from the average rate of the preceeding month of the locality. The said period shall be decided and proclaimed by Presidential Order.

Art. 4. All those who tender silver bullion to pay their taxes or duties to the Government or to have it coined into national coinage shall be allowed to do so at the rate of 6 tsien, 5 fen and 4 li of a k'uping tael of pure silver for one Yuan. But silver bullion having a standard of fineness different from the k'uping tael shall be rated according to the annexed "table of conversion."

Art. 5. In places where official receipts and disbursements are made in silver bullion or sycee, the provisions mentioned in Art. 4 are applicable and the various kinds of bullion or sycee so received or disbursed shall be rated in Yuan, according to the above-mentioned table of conversion. But in places where official receipts and disbursements were before made in copper cents or cash or sycee being first rated on cash which cash is again rated in dollars, the local public offices shall report the exact amount of the various kinds of coins so received or disbursed to the National Taxation Bureau and obtain the latter's approval before the required conversion is made.

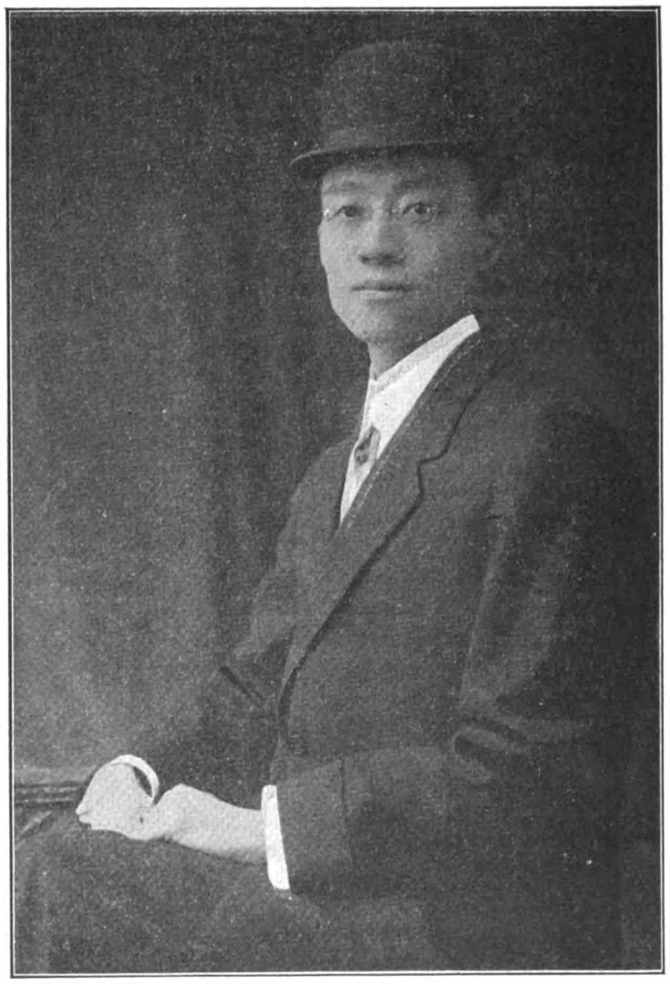
Art. 6. The provisions named in Arts. 4, 5 and 7 shall be applicable to all taxes which shall be reckoned down to "li." All units below "li" shall be reckoned in the following manner: all units below 4 shall be disregarded, but those above 5 shall be considered as one "li."

Art. 7. All private debts recorded in sycee are to be converted into Yuan according to the annexed table of conversion. Those recorded in copper cents, cash, etc., are to be converted into Yuan according to the provisions of Art. 6. All bills, documents, etc., not so converted in Yuan shall be rated, in case of lawsuit, on the current rate of conversion, ruling on the day when the present Articles are proclaimed by Presidential Order.

Art. 8. Throughout the Republic when the national coins are offered in payment, no matter who the person may be or what the account may be, the national coins must not be refused.

Art. 9. Any one who infringes or violates the provisions of Art. 4 of the National Coinage Law or Art. 8 of the present Regulations may be accused in Court by the person concerned. After conviction a fine of over $10 and below $1,000 will be inflicted. Any officials and managers of public properties and undertakings who violate the above-mentioned Arts. may, after conviction, be inflicted with a fine of over $50 and below $3,000.

Art. 10. The place and date of execution of the present articles shall be decided and proclaimed by Presidential Order.



MR. N. T. WOO, B.S., M.A. (WISCONSIN) PH.D., who has taken a prominent part in the Currency Reform movement.

NEW CAPITOL BUILDING FOR MANILA

The *Manila Daily Bulletin* reports that owing to the crowded condition of the assembly committee rooms at 158 Cabildo, and the Ayuntamiento, a movement is on foot in assembly circles to construct a new government building on the site opposite the Ayuntamiento, between the Intramuros fire station and the supreme court building. Speaker Osmena, it may be stated on good authority, is himself interested in the project and is endeavoring to have it carried out.

The site is the same one on which foundations are still in existence and are in perfect condition. The breaking out of an insurrection prevented the construction of the palace at that time, but the plans are still in the Ayuntamiento and could be easily modified to suit conditions to-day.

The plans for the building were designed by Alejandro Olang, a Filipino engineer. They show an extremely beautiful two-story stone building, slightly larger than the Ayuntamiento, with a court and garden in the center.

The cost of the building, as estimated by the Spanish engineers, was P243,823 Mexican crowns or pesos. Since that time prices of construction and material have risen a great deal and it is probable that this estimate to-day is too low by at least 100 per cent.

Originally the governor's palace stood on the site selected for the new building. It was destroyed by an earthquake in 1863. The foundations now there were laid for a new and far more magnificent palace to replace the destroyed structure.

It is the plan of the assembly to utilize the new building as a capitol until the Burnham plan is carried out and the large capitol on Burnham Green is erected. After that time, the Ayuntamiento is to be converted into the city hall and the new structure is to be transformed into a museum.

THE COAL FIELDS OF CHINA

An interesting paper upon the mineral production and resources of China has been contributed to the Transactions of the American Institute of Mining Engineers by Mr. Thomas T. Read, formerly Professor of Metallurgy at the Imperial Pei-Yang University, Tientsin. This paper contains much useful information regarding the little that is known of the immense coal reserves of China. That information should be wanting upon this subject is not surprising, because China has not, so far, recognized any necessity for the development of her mineral resources either by her own people or by foreigners. Her coalfields are numerous and widely scattered, and contain generally coal of good quality—anthracite, semi-anthracite, bituminous, semi-bituminous, and lignite.

In the province of Manchuria the principal coalfield is that of Fushun, near Mukden, which is said to contain 800 millions of tons of workable coal. The province of Chihli contains numerous coalfields, and is the most important producer at the present time. The coals are anthracite, bituminous coal, and lignite. The province of Shantung contains anthracite and bituminous coal. The most famous coal areas are in the province of Shansi. There are two regions—the anthracite and the bituminous. The principal seam in the anthracite area is from 12ft. to 30ft. thick, and persists over wide areas, and the bituminous area contains good workable seams. It has been estimated that the anthracite resources of this province amount to 630,000 millions of tons, while the bituminous resources are said to be even greater. The province of Shensi contains both anthracite and bituminous coal, and that of Honan contains an extension of the Shansi anthracite field. The Great Southern coalfield, which possesses good bituminous coking coal and anthracite, is in the provinces of Hunan and Kiangsi, and there is an immense coal area in the province of Szechuan, though information regarding it is conflicting.

Generally speaking the coal resources of China, both as regards extent and quality, are considered to compare favorably with those of the United States of America.

Mr. Daqueen Tao, B.A., who was a member of the Currency Reform Commission.

OIL IN BRITISH NORTH BORNEO

Borneo has attained an important position as an oil-bearing territory, and its importance appears to be growing, says *The Times*, London, and continues:—For a long time production on a commercial scale was confined to Dutch Borneo, including Tarakan Island, from which the Royal Dutch Petroleum Company obtained 212,000 tons of oil in 1912. Now, however, British Borneo is coming to the front. The whole of the petroleum rights in British North Borneo, about 30,000 square miles in extent, are owned by the British Borneo Petroleum Syndicate, a company registered about 18 months ago as a reconstruction of a former Borneo and Burma syndicate. Its concessions give it the right to lease all oil-bearing land at a peppercorn rent and free of royalty or export duty. On the western coast of North Borneo, is situated the Klias peninsula, where as a result of careful prospecting, 440 square miles of oil-bearing land have been taken up. The authorized capital of the British Borneo Syndicate being only £120,000 in 10s. shares, of which about £65,000 has been subscribed, the energetic exploitation of so large an area was clearly beyond its financial resources. Hence the co-operation of the Netherlands Colonial Petroleum Company, which is closely connected with the Standard Oil Company of America, was obtained, and an arrangement entered into by which the latter undertook the development work, including drilling in the Klias peninsula, and is under an obligation to spend a large sum on these operations, the British Borneo Syndicate receiving a substantial royalty on all the oil produced.

The Sarawak (British) country which has been prospected and developed by the Royal Dutch and Shell Companies (through the Anglo-Saxon Petroleum Company), has but recently justified the expectations of those who firmly believed in its oil riches. It is, in fact, only within the past month or so that the developing companies have had their hope and patience rewarded with results from the producing wells at Miri. These, we are told, are very satisfactory. The Miri production is additionally important in its connection with British enterprise, because the wells are close to Brunei, where the new development to which we are about to refer centres. It should first be mentioned that there are oil outcrops on Sebetik Island, off the south-eastern extremity of North Borneo. This island is half British and half Dutch. The petroleum rights of the British half were originally held by the British Borneo Syndicate, who sold them to the Sibetik Petroleum Company of Amsterdam, the consideration being an allotment of £72,916 fully-paid shares in that undertaking. The Sibetik Company will receive a royalty on all oil produced by the Royal Dutch Company, which has undertaken the exploitation of the deposits and is now sinking the first well.

It is, however, Brunei, in the north-west of Sarawak, that is the pivot of immediate interest. The British Borneo Syndicate holds the petroleum rights between the Barram and the Tutong rivers, over a territory consisting of 19 square miles, held on lease, and 150 square miles held on prospecting leases. The rights for the rest of Brunei belong to the Royal Dutch and Shell Companies. The syndicate's territory contains oil-bearing formation similar to that of the adjacent Miri oilfield in Sarawark, which is proving so satisfactory to the Dutch and Shell interests. Two wells are now being drilled on the area of the leases that have so far been taken up. The contiguity of the properties of the syndicate and the Shell Company in Brunei, and the similarity of the formation to that of Miri naturally pointed to an amalgamation of interests. It is proposed to effect this by means of a new Brunei Company which is to be formed, and the price it is to pay for the combined Brunei rights is 700,000 fully-paid shares of the nominal value of £1 each. In consideration of transferring its rights to this new company the British Borneo Syndicate will receive 400,000 of the shares; and in consideration of acting similarly with their own rights, also finding £150,000 for working capital for the new company, the Shell and Royal Dutch will receive 200,000 shares, the remaining 100,000 shares going to intermediaries in Holland. It will be seen, therefore, that the British Borneo Syndicate's future revenue will depend upon—(1) the royalties paid by the Netherlands Colonial, otherwise the Standard Company; (2) the dividends on £72,916 fully-paid shares in the Sibetik Company; and (3) the dividends on £400,000 in the new Brunei company. The value of these interests will, of course, depend upon the results of the several enterprises. It is further stated that the syndicate has a reserve of unissued shares enabling it to find sufficient capital to provide and instal such pipe lines and storage tanks as the oil production may make necessary.

"MIRACULUM" GRAPHITE PAINT

The basis of "Miraculum" Graphite Paint is, as the name implies, a graphite of 98 per cent. pure carbon, which is prepared in an electric furnace at a temperature of 8,000° F. This graphite, while possessing the advantage of being a pigment which closely attaches itself to the coated surfaces, is an absolutely inert and neutral body, and being resistant to chemical action, is especially suitable as a base for a protective paint.

The covering power of "Miraculum" Graphite Paint is very great. One gallon weighs about 11⅛lbs. and will cover 800 to 900 sq. feet on a smooth surface. Any enquiries concerning "Miraculum" Graphite Paint should be addressed to the makers, Messrs. J. Dampney & Co., Ltd., Bute Docks, Cardiff.

TARIFF REVISION IN CHINA

Points from Sir Robert Bredon's Articles

In a series of articles in the *Peking Gazette* Sir Robert Bredon presents facts and arguments in regard to tariff revision. Following are some of the chief points made:—

"China, said the Chinese Commissioner, Sheng Hsuan-huai in 1901, can form no national budget entirely of her own motion."

"There were, he said, two separate and important components in taxation on foreign goods brought to China. First the maritime duty....and secondly the transit and inland duties."

"His purpose was in principle to begin taking the general idea sanctioned by the Boxer protocol as a basis and in accordance with it revising the tariff so as to make it the effective 5% on the value of imported goods which had always been acknowledged as the rate of China's tax on foreign produce: then it was suggested, in sequence, to add one and a half times the tax thus arrived at. The two and a half duties were supposed to represent, a 12.5% duty. In return for this payment China undertook that this duty once paid *no further duty of any kind soever* should be levied on foreign goods."

"The revision (sanctioned by the Boxer protocol) meant to give an effective 5 per cent., gave in reality a tariff which only brought in about 4½ per cent. on the then actual value of trade. It thus inflicted an injustice on China from the very start, an injustice which has continued and grown during the dozen years the tariff has been in force."

According to the treaties:
"Both tariffs (export and import) are on a five per cent. *ad valorem* basis, and both are held as being liable to be revised on the demand of either side interested, every ten years."

"Up till 1901 there had been no real revision of either the import of export tariffs, though varieties of readings and interpretations and such like may have made slight alterations from time to time."

"This is therefore now the position. China says to the Powers:—I am entitled, on a well understood principle which you all have admitted, to have a 5% tax on foreign imports: I am similarly entitled to claim decennial revision from each of you if I consider a tariff made over ten years ago no longer gives me my due. It is more than ten years since my import, and more than fifty since my export tariff has been revised. These are now both equally entitled to a decennial revision: I feel that revision is both necessary and due and I now ask you to undertake it in consultation with me as a matter of principle and justice—and she might add, and I don't expect any quibbling use of legal technicalities to stand in the way."

"China has already addressed a circular despatch to the Legations of all the Treaty Powers asking for revision." (The request has been acceded to in principle by Great Britain, the United States, Belgium and Holland.—*Ed.*)

"What is wanted is not merely a revision of the 1901 tariff but the re-establishment and the putting in practice of the old time tariff principles."

"The abolition of *likin* on any reasonable terms one can endorse as a change eminently desirable in every interest."

"The present export duty tariff has a two-fold character, first, though such does not appear at first sight, it is a tax no foreign trade fixed and recognised by Treaty, and as well, secondly, a tax representing a very old established tax on native produce carried coastwise."

"There is in China no Income Tax, no Death Duties, no Education Rate, no Country Cess, no Poor Rate, little or no even indirect consumption tax levied on the labourer through his liquor, tea, tobacco or sugar....Chinese export duty in China only represents to a certain extent an equivalent for the aggregate of other duties in Western countries."

"Article X of the British Treaty of 1842 provides that:—duty paid imported merchandise may be conveyed by Chinese merchants to any province or city in the interior of the Empire of China on paying a further amount as transit dues, which shall not exceed....per cent. on the tariff value of such goods.'....In a special convention made in Hongkong in June, 1842, it was stated that the rates of transit duty:—'shall not exceed the present rates which are upon a moderate scale.'"

"When foreign goods have been entered at a port and paid full Import duty, they may be conveyed into the interior covered by a pass certifying payment of an additional half duty, which pass can be equally demanded by a Chinese or a foreigner, and is held as entitling the bearer to pass the goods at every tax station of whatever kind so long as the goods are actually in transit to a declared destination with (by recent legislation) permission to sell same en route in whole or in part at any place at which a market can be found, provided certain formalities have been complied with and native local authorities properly notified."

"In the opinion of the writer the whole question of inland charges on foreign trade requires to be gone into not only in the interests of the trade but of honest administration in China. There are wrongs on both sides and a settlement on a 'give and take by both' principle is desirable."

"Even if China does not now suggest the abolition (of inland taxation on goods) it should be proposed—one might be permitted to use the word 'demanded'—as a necessary concomitant of any treaty revision. Such a demand is by no means unreasonable, for China has herself in the preamble of Article VIII of the British Treaty of 1901 admitted its reasonableness in the following terms:—'The Chinese Government recognising that the system of levying *likin* and other dues on goods at the place of production, in transit and at destination, impedes the free circulation of commodities and injures the interest of trade, hereby undertake to discard completely those means of raising revenue with the limitation mentioned in Section 8.'"

"Article VIII established certain principles:—(1.) That China was prepared for total abolition of inland taxation on foreign goods in return for an import surtax. (2.) That Great Britain was willing to agree to and support the Chinese arrangement, and, we may hope, did so in the belief that it could be carried out. (3.) That a surtax to an extent of 7½ per cent. *ad valorem* was not considered unreasonable or likely to be an unbearable burden on British trade."

"The following few figures will, the writer thinks, give a fair estimate of what the Customs revenue would be if the Import tariff is raised to an effective 5% and the 7% surtax imposed. The net figures may be taken as what would be actual net total available from Inspectorate collected taxes for repayment of loan charges, etc. The figures which are in every case merely round numbers near the actual tolals given in Part I of the Returns of Trade, are close enough for our pupose.

Total Customs revenue for 1912 ....Tls.	40,000,000	
Add for surtax	32,000,000	
Add for effective 5% say	7,000,000	
Total		79,000,000
Deduct opium duty	1,800,000	
Deduct opium likin	4,400,000	
(This assumes the extinction of the trade).		
Transit Dues	2,000,000	
(which the surtax replaces)		
Tonnage Dues	1,400,000	
(otherwise used).		
Cost Inspectorate of collection (Chinese Superintendency and Administration) say	5,000,000	
Additional cost involved in collection of surtax and increased accounting work of Customs	3,000,000	
Total Deductions	18,000,000	
Net		61,000,000

Above figures do not make any allowance for what a revision of the export tariff, or an export surtax or some other tax in lieu of that taxation may bring in; nor for the additional revenue such as may be expected from a growing foreign trade."

"The most important consideration in any new system is to reduce to a minimum the number of separate collecting departments and to cut down the staffs of those established to a minimum. The old system of finding berths for the unemployed and keeping them in them—still unemployed—should be entirely discountenanced. It seems there will be certain collectorates or departments of collectorates which must be controlled by representatives of the Central Government and directly responsible to it. In these may be included the Customs, the Salt, the Railways, Posts and Telegraphs, Irrigation works, River Conservancy, Woods and Forests and perhaps others. But all provincial taxes, including the Land Tax, which have to be collected on the beggarman's system, from door to door, should be aggregated into a single payment and collected periodically by one single provincial collectorate as is done in the United States where State, City and County taxes all pass into the same Treasurer's hands and are apportioned to the several spending departments as the constitution and law provides."

DETAILED DESCRIPTION OF THE ANGER IMPROVED AUTOMATIC BRAKE ADJUSTER

A very clever and effective device which has lately been brought out by Mr. John Edward Anger, Inventor and General Manager of one of the largest car-building Companies in England, and which is owned and controlled by the Anger Manufacturing and Supply Company, whose registered offices are in the Bank Chambers, 38 Fishergate, Preston, Lancashire, England, is called the Anger Improved Automatic Brake Adjuster.

This device is not quite two years on the market, and is being adopted by most of the principal tramways in the United Kingdom, as well as in many foreign countries.

This device is absolutely automatic, and is designed to work on any type of truck either single or bogie, no matter what type of platform brake gear is used, as it does not necessitate any alterations or changes in any parts of the truck or braking arrangement to properly instal it on any type of truck.

It is a well known fact that all tramcars after their service during the day have to be brought to the car depôt and the brakes adjusted during the night, and the wear of the shoes taken up and the shoes replaced in their proper relation to the wheels ready for the next day's labors. Oftentimes when the traffic is heavy and the brakes are used very often in the day, the shoes become worn more than ordinary and the cars have to sometimes be returned to the depôt for this slack in the shoes to be taken up and adjusted, or men sent out on the road to do this work by hand; either way is a big cost in the operation of cars, and oftentime it is considerable loss of revenue if the cars have to be taken from service to have this work done.

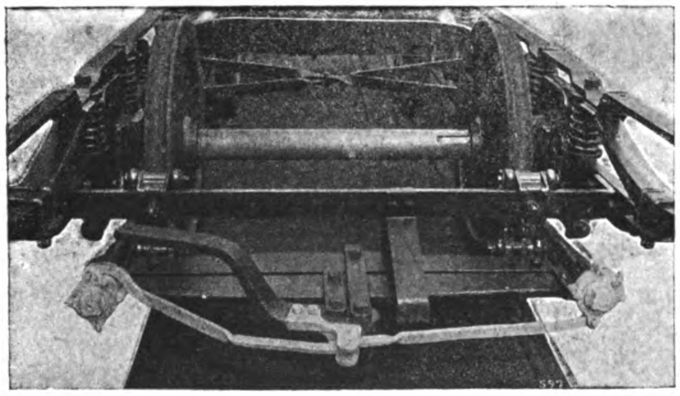
TRADE

MARK

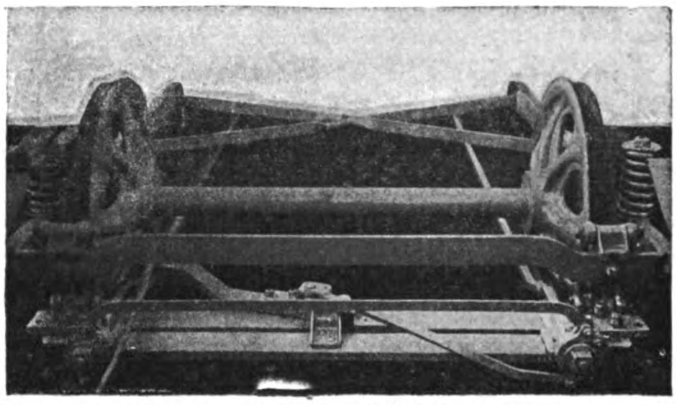
The Man with the Wrench.

Again this hand adjustment is oftentimes neglected, and it is always more or less inaccurate and unreliable, with the consequence cars are often put into service with the brakes improperly adjusted, so that the motorman or driver does not at all times know that when he uses his brakes, he will have the proper application of all four shoes to the wheels and in consequence he does not have the proper control of his brakes.

When the Anger Improved Automatic Brake Adjuster is installed it automatically takes up the wear of the brake blocks or shoes when the wear takes place, while the cars are in service, and when the time comes to take the cars to the depôt for the night, the brakes are already adjusted, and the cars are ready for the next day's work, and no hand adjustment is therefore necessary.



Anger Adjuster on Single Truck Narrow Gauge.



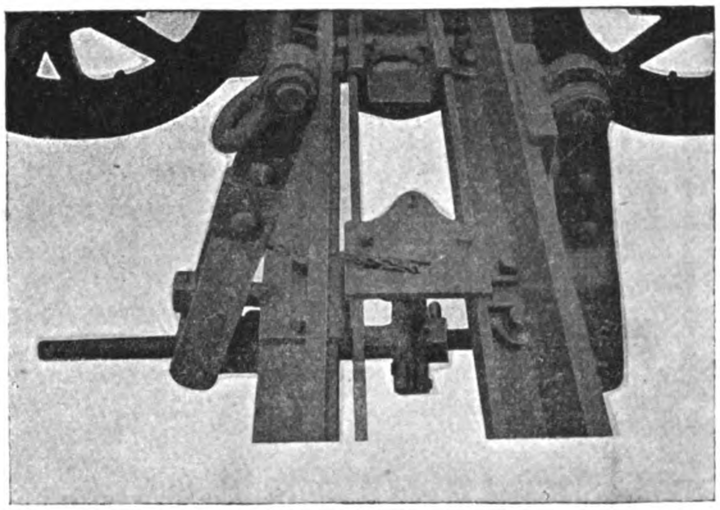
Adjuster on Single Truck Standard Gauge.

When the Anger Automatic Brake Adjuster is put on, it absolutely eliminates the dependence upon this hand adjustment, and the brakes are at all times kept in perfect adjustment, and the motorman or driver knows and feels at all times that his brakes are in order and effective as they should be.

This question of adjusting of brakes and the shoes as they wear is one of the most important parts of safety operation of tramcars, for inaccurate adjustment does not give the assurance to the motorman that he should have, and the car is never under absolute control.

This Brake Adjuster was examined by the English Board of Trade after a series of trials and experiments, and it was found to be a very positive, reliable and dependable device, and permission was given for its use on all tramways in the Kingdom.

It is a known fact to all tramway managers and engineers that automatic brake adjustment eliminates many car house faults. It also gives a safety in the operation of cars that cannot be obtained in any other manner. A single accident which does occur when it is least expected costs more than brake adjusters, and this device is now called a safety and necessary acquisition to the equipment, if for nothing more than the assurance and safety that it gives.



Adjuster on Bogie Truck.

It can be easily seen by its accurate, positive and reliable automatic adjustment, that the shoes are at all times kept the proper distance from the wheels. It prevents the shoes from dragging on the wheels, which is another fault always found with the hand adjustment, and it therefore not only gives a safety to the operation of the car, which is the most important factor, but it saves shoes and current, as well as labor, which in themselves are items of great importance to the maintenance of tramways.

By actual tests under all conditions it has been found that the Anger Brake Adjuster will pay for itself in 90 days, so the cost of the apparatus is very low, and having so very few parts, and being so simply constructed, there is practically no maintenance.

It is a well known fact that to have a device of this kind to obtain the automatic principle, the device must be operated in the equipment at a point nearest to where the slack in the shoes take place from the wear, and this device is placed on the brake rods on single trucks, and on the turnbuckle on bogie trucks, which is the nearest place to where the adjustment has to be done, and is the only correct place mechanically to adjust or take up the wear of the shoes.

We give cuts of the device, showing it in actual service on trucks, as well as cuts of the construction of the device, and a plan showing its method of application, and by referring to these, we feel sure it will be found a very interesting subject, especially as automatic brake adjustment is at this time now receiving the attention of engineers in nearly every part of the globe, wherevertramways are operated.

By referring to the plan, which is shown of the adjuster on a single truck, it will be noticed the following is a description of the principal parts. The adjuster itself is simply composed of two ratchet boxes, an upper and lower operating rod, and a fulcrum bracket. This is practically all that comprises the adjuster, but of course different parts have to be furnished with the adjuster itself according to the type of truck it is put on.

A. This is the ordinary brake lever on a single truck.

B. This is the operating rod attached to the fulcrum casting which is bolted into the brake lever and the other end of this rod is attached to the lugs of the adjuster itself used for operating same.

B1. This is the fulcrum bracket with a lip on same to take the rod.

C. This is the top connecting rod which is used to connect both adjusters, as an adjuster is located on each rod, and this connecting rod actuates both adjusters simultaneously.

D. This is the threaded nut, which is made of phosphor bronze, which prevents corroding on the brake rods when working on same. It is enclosed in a casing, which is dirt and mud proof and prevents it being interfered with.

E & E1. This is the box and cover or called the casing and cover which holds the threaded nut or ratchet and which also carries the little pawl.

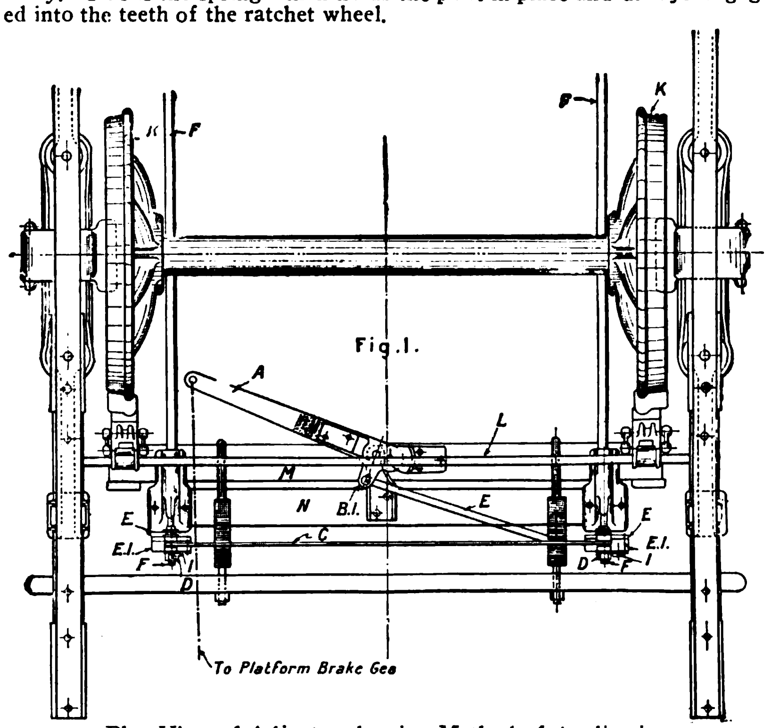
F. These are the ordinary brake rods which are on a truck.

G. This is the little pawl which engages in the ratchet wheel.

H. This is the ratchet wheel which is fitted into the nut.

I. This is the thumb lever outside of the adjuster which is used to disengage the ratchet so the adjuster can be wound back in the replacing of shoes, making it unnecessary to take the apparatus apart to replace the shoes. In this manner the pawl is disengaged, the adjuster can be wound back, the old shoes replaced with new ones, the adjuster wound back to its original position, and the adjuster is then ready for its operation again.

J. This is the spring which holds the pawl in place and always engaged into the teeth of the ratchet wheel.



Plan View of Adjuster showing Method of Application.

K. These are the ordinary nuts on the brake rods which are used for the old adjustment, which are simply replaced by the adjuster. It will therefore be seen the adjuster simply takes the place of the ordinary hand nuts, and it is therefore called the Man with the Wrench but Always on Duty. The adjuster simply takes the place of the night man with the wrench, but by being automatic is more accurate, and absolutely dependable, safe and sure at all times, while the cars are in operation.

L. This is the truck end bar on the usual trucks.

M & N. These are the ordinary brake beams on the truck.

The mode of operation is very simple as will be seen. In the application of the brake, the brake lever A or live lever is drawn outward, which causes the connecting rod B to move the casing or box E & E1 in the direction of the arrow. Should the live lever A or brake lever be allowed to travel farther than a certain point (which travel is always caused by the wear of the shoes) the casing E & E1 which carries the pawl G will travel on the ratchet nut D, the pawl engaging with same, and upon the brakes being released, and the brake lever A or live lever returning to its normal position, the ratchet H will be moved forward one tooth and thereby tighten up on the brake rods F to the amount of the wear that has taken place, and allowed this extra travel of the brake lever A.

The operation is always in one direction, and this winding process keeps the shoes replaced as soon as they wear to their proper relations to the wheels.

An important point to note is that this brake adjuster does not come into operation every time the brakes are used, but only as the wear of the shoes take place, and the moment the shoes have the slightest wear, the adjuster takes this up automatically.

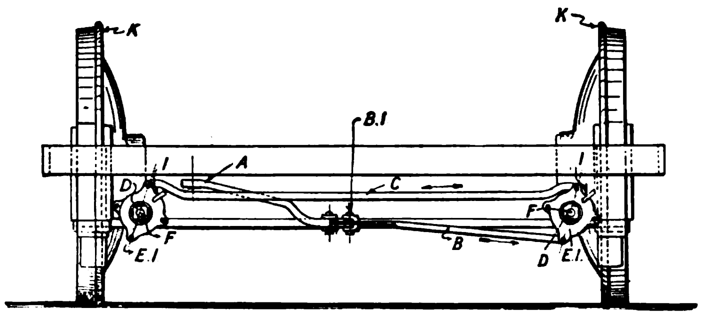


Fig.2.

End View of Adjuster on Single Truck.

There are brake adjusters which are simply a more convenient form of hand adjustment, but the Anger Device eliminates the hand adjustment absolutely.

Thus it will be seen that it does not matter how many times the motorman or driver uses his brakes, it does not affect the brake adjuster for it simply means that this Anger Device simply governs the predetermine travel of the brake lever, and only operates when the brake lever comes to a certain point caused by the wear of the shoes.

Thus by this device governing the predetermined travel of the live lever, the brake lever can never pass its center at any time, and thus its leverage can never be spent, and the motorman or driver can at all times have perfect braking results, and will at all times have a quick and positive application of all four shoes to the wheels, and thus perfect control of his car.

This device can be used where air brakes are used, for it has nothing to do with the air brake, for it will be seen that if air brake are used and a brake adjuster is used on the piston, this does not adjust the wear of the shoes, and simply adjusts the travel of the piston, and the brake shoes have to be adjusted just the same by hand, whereas if the Anger Improved Automatic Brake Adjuster is used, as it governs the brake lever, which is the vital part of the braking mechanism, no piston regulator of adjuster is required, as the piston travel will always be properly regulated if the brake lever is cared for and the brake shoes as they wear taken care of. When a piston adjuster is used, if you want automatic brake adjustment in order to eliminate the hand adjustment, you have to have adevice to adjust the wear of the shoes.

This operation of the Anger device goes on continually until the shoes are worn out. When the shoes are worn out, and new shoes are to be replaced, it is not necessary to uncouple any part of the device but simply press down the pawl handle, when the adjuster becomes the simple nut, unwind, replace the shoes and wind up and go on same as before, so the replacement of shoes is as simple, if not simpler than the old method.

Another feature of the Anger device is that when once put on a truck the shoes can be kept as close to the wheels as may be desired or they can be kept as far away from the wheels as required, for a fulcrum bracket is used, which enables this adjustment to be had.

It will be noticed that at the fulcrum bracket where the operating rod is attached, the farther out this attachment is made to the lips of the fulcrum bracket the quicker the adjuster comes into action with the least amount of travel of the brake lever, thus the shoes are kept closer to the wheels, and the closer in this attachment is made to the large hole or pivotted point, the farther away the shoes are kept from the wheels, but whatever distance the shoes are adjusted from the wheels in the beginning, this distance will always be maintained at all times, until the shoes are worn out. Thus an even wear is always obtained in the blocks, and a great saving can be had.

This Anger Device is not expensive. It is very reasonable, and only one set is required to a single truck.

As stated before it is not yet two years on the market, and it is now used by all the most important tramways in England:—

In foreign countries it is in use in Para, Rio de Janeiro, Santoz, Brazil. In Cordoba, La Plata, Buenos Aires, Rosario, Argentine, on all of the roads in South Africa, and many roads in Australia and New Zealand, as well as in Canada, and the United States.

It is also in use on many systems in Japan, and on the Hongkong Tramways, and Shanghai Tramways.

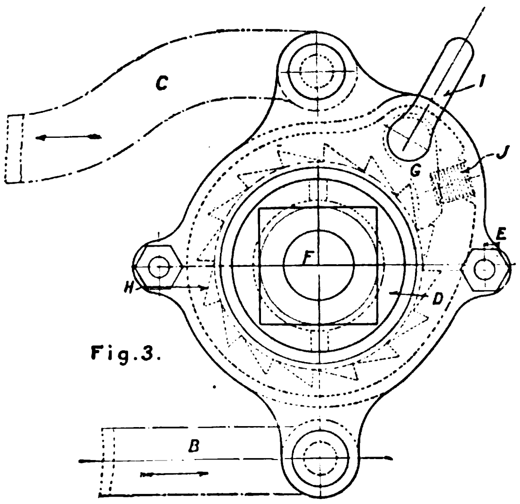


Fig.3.

Interior View of Adjuster.

FAR EASTERN RAILWAYS

CHINA

Kaohsien Mining Railway.—The Ministry of Finance has issued a notice offering the Kaohsien Mining Railway at Fangshan, near Liuliho, Chihli, for sale. The buildings and all property pertaining to the line are included in the deal. The minimum price named is Tls. 2,400,000. The money is to be paid in twelve annual instalments, but the purchaser must pay one-fourth of the whole sum during the first year. The notice specifies that only Chinese citizens may send in applications, and that no foreign capital will be admitted. A Peking paper announced towards the end of January that Mr. Yuan Chung-chih, former expectant Taotai of Chihli, has taken over the Line from the Government. This railway has been sold to a Company of which Mr. Yuan is the head.

Prospective New Railways.—The Ministry of Communications, reports a Peking paper, has been planning to extend the railway from Peking to Jehol and from Jehol to Chihfeng through Shunyi. The length of the extension is more than 700 *li*. After the Changsui line has been completed, the railway from Chihfeng to Dolonor and Chaoyang will be built. The whole line is about 1,400 *li* long. Another line from Kalgan to Urga, about 2,400 *li* long, will also be constructed.

Peking-Hankow Line.—The main station of the Peking railway at Hankow is likely to be moved from its present position behind the French Concession, though no definite decision on the matter has yet been reached, says the *Central China Post*. Another scheme that has been considered is the building of a big terminal at Kilometre Ten, with up-to-date apparatus for the transference of cargo from the trains to shipping in the river and *vice versa*. Such a terminal would be almost indispensable for the transhipment of goods from the Peking line to the Canton line, when the latter is opened.

The New German Lines.—The Tsingtao correspondent of the *North-China Daily News* wrote on January 13:—The recent agreements with the Chinese Government, whereby the railway line to Ichowfu and beyond is to be built from Taingtao, is of great importance to Tsingtao. An outlet in this direction to reach the south-western part of the province, and develop its possibilities for both imports and exports, has been for years a crying need. In this respect it does not seem of less importance than the main line to Tsinanfu, the capital. One has always felt that it was a misfortune for Tsingtao commercially, that the previous concession for building this railway was transferred to the Chinese in exchange for the privilege of building the northern end of the Tientsin-Pukow railway. This very important region has consequently been left for many years now, with very little development, whereas it might have been by this time a very important and efficient feeder of this port.

The line from Tsinanfu west, connecting with the Peking-Hankow railway will of course be important, and a good business venture for the promoters, but whether it will greatly benefit Tsingtao is perhaps questionable. The great natural advantages of the port are, however, certain to give it a good share of the general benefits of railway development.

Anking Chengyankwan Line.—The following is from the *Peking Daily News*:—The project of building a railway from Anking to Chengyangkwan was initiated during April, 1913, by Kuan Peng, a person who was involved in the Kiangsi rebellion last year. At the moment of inception, the scheme was criticised by the press as being impractical. Subsequent developments raised the suspicion that the promoters were trying to make use of the railway for an improper purpose.

The Ministry of Communications has received another petition regarding this railway from the Chengyangkwan Chamber of Commerce. In replying to this petition, the Ministry objected to the building of this line, on the ground that it interfered with the Pukow-Singyang Railway. As the Chamber of Commerce alluded to the flotation of a foreign loan, the Ministry pointed out that business men were not allowel to borrow foreign capital to build railways. The Tutuh of Anhui has been asked by a despatch to prohibit the exploitation of illegitimate profit by utilizing the name of this project.

Ningpo-Hangchowfu Line.—A correspondent wrote from Shaohingfu on January 19 as follows:—The Railway from Ningpo to Hangchowfu—the provincial Capital—is not yet finished by a long way. The Ningpo side is more enterprising and energetic in carrying out their contracts than this Shaohing side. The road is brought from Ningpo to near a large market town called Pah-kuan, at which place they will have to erect a Bridge across the Dzao-ngo River, a river which runs parallel with the Tsien-t'ang river, and both of which enter the Hangchow Bay, and both of which are affected by the tidal-wave which comes up from that Bay. Both rivers will have to be crossed by railway bridges, as the line is to run from Ningpo to Hangchow direct, thence to Shanghai, and, perhaps, they will eventually make on the line to run up the Tsien-t'ang on to Chuchowfu, and on to Yuohshan, and to connect with the Fuchow and Canton Railway. I can get no definite information re the opening of the railway from this to the native port of Si-shing, and over the river to Hangchow City. To-day we hear one talking and laying it down in good order and in great assurance that the opening and finishing of the long looked for railroad is not far off! The next day, the very opposite view is stated by another and with great confidence also.

Ichang-Szechuan Line.—Writing from Ichang on January 16 a correspondent says:—It is reported here that arrangements have now been made for the resumption of work on the Hankow-Szechuan Railway. It may be remembered that the section from here to Wanhsien had been started by the Szechuan Railway Co., and good work was put in for about a couple of years. Then the revolution came along, and it had all to be stopped, and since that things have been going to wreck and ruin, through exposure and the want of care. Some months ago a band of American engineers arrived to undertake fresh surveys and make an estimate of the cost of what had been already done. This must have been accomplished satisfactorily, and if it is true, as reported, that work on the construction of the line is to be resumed after the Chinese New Year, it will make this a busy port, as there will be lots of railway material to be transported here for use in the building of the line.

The German engineers are still surveying the Hankow-Ichang section of the same line, and things must now be quiet since that untoward incident that happened at Pan Yue San.

Railways for Fukien.—Admiral Liu Kuanhsiung has petitioned the President Yuan Shih-kai for the provision of Railways in Fukien. It the course of the petition he says:—"Upon investigation we have found that sometime ago the Fukien merchants collected shares for the construction of a line from Amoy to Changchow as an experiment. However the financial strength of the merchants failed and the construction was stopped before the line was completed. It has been recently reported that the said Company has requested the Government to buy the line. The proposal of the said Company to yield to Government ownership is indeed a wise and liberal step. This trunk line will effect a connection with three other lines, namely, Kuangtung, Chekiang and Kiangsi; and an estimate of its length is no less than two or three thousand *li*. Not to mention the difficulties in connection with the raising of funds among the merchants, the policy of the Government ownership, which has been decided upon, will not allow the people to construct railways along with the Government's. If for the construction of this line, additional taxes be levied on the people, it would no doubt incur their hatred before anything can be achieved. Surely this will not be done by our Government. We have arrived at the conclusion that the only means for to-day is to borrow money for the construction, and pledge the line as security. As Fukien is situated in a very secluded place, there are only one or two Powers who cherish any aggressive design regarding it, and the rest of the Powers have always been friendly. We can negotiate with the friendly Powers for a loan. In view of the undeveloped condition of the province and the poverty of its inhabitants, when nine out of the ten families are destitute of means of livelihood, and the officials stand helpless, the only salvation of the province is the construction of railways, on which will the life and death of the province depend. If the Government should hesitate to launch the plan, it would be useless to regret in the future. Furthermore this line is of very great importance to both Fukien and other neighbouring provinces. If it be immediately divided into sections and the work be started at once, it is but within our expectation that industry will be greatly developed, and the bad characters will be reduced. Thus all troubles both internal and external may be averted. The benefit will not only be reaped by this part alone in the South. With regard to the regulations for the conclusion of loans and the construction of the railway, it is requested that the Ministries concerned will be instructed to formulate them."

Kiukiang-Nanchang Railway.—A correspondent writing from Kiukiang on December 27 said:—The task of completing the Nan-Hsun (Nanchang-Kiukiang) Railway is being pushed on steadily, though hardly energetically. Quite recently a large quantity of bridging material was landed, which no doubt in the fulness of time will find its way to T'eian, where it is badly needed. Two new locomotives, built by the American Locomotive Co., have also been acquired, while the lately erected brick engine shed is now ready for occupation. Optimists expect that through traffic to Nanchang will be instituted by the spring. "'Tis a consummation devoutly to be wished." In the meantime it is worth noting that a representative of the Railway is now in Peking endeavouring, if report be true, to induce the General Government to take over the enterprise, presumably not as a gift. Funds evidently are scarce, for the Nanchang authorities are now levying a railway (!) tax on native goods *carried by junk* from there to Kiukiang.

Shanghai-Hangchow Railways.—The Board of Communications from January 1 assumed control of the Kiangsu section of the Shanghai-Hangchow Railway, and this control is vested in Mr. Chung Mun-yew, Managing Director

of the Shanghai-Nanking Railway. The Shanghai-Hangchow Railway has been the subject of contentions, and was once a large factor in the struggle between Peking and the provinces for power. The local authorities strenuously objected to its being under the control of the capital, and ultimately the line came under the management of two bodies of shereholders, the Kiangsu and Chêkiang shareholders, to all intents and purposes two companies. The Kiangsu company has now gone into liquidation, and as a consequence the Government has taken over its section of the railway.

For a long time schemes have been afoot for the linking up of the Shanghai-Nanking and Shanghai-Hangchow Railways. The original intention was to build a line from Soochow to a place like Kashing, but nothing ever came of it. It is believed that fresh negotiations for linking up have been started, but for the time being the proposals are much less ambitious, a line from one of the stations near Shanghai, such as Chenju, Nansiang or Anting, being suggested to meet the Hangchow railway some distance past Lunghua. The situation is, however, still complicated by the opposition of the Chekiang shareholders to any suggestion of control by the Central Government over their part of the line. In Kiangsu the railway runs for a distance of only about thirty miles, by far the greater proportion being in the neighbouring province, and it is feared that negotiations cannot be satisfactorily carried through, until the objections from Chekiang have been overcome.

After the section of the railway from Shanghai to Hangchow was completed the scheme was to carry the line through to Ningpo. Work upon this section was started a considerable time ago, but up to the present all that has been accomplished is about forty miles open to traffic from the Ningpo end.

Projects.—It is reported that the French are pressing for the Yunnanfu-Chengtu railway concession with a view to linking up the railway from Tatung (Shansi) to Chengtu and the Hanoi-Yunnan system. This would give Franco-Belgian interests a valuable strategic connection across China between Kalgan and Hanoi. These lines would cross at Sianfu the Franco-Belgian railway from Lanchowfu to the coast. This last line is to terminate at Haimenting at the mouth of the Yangtse, the original terminus, Haichow, having proved unsuitable.

Since this was written the French have obtained an option on the Yunnanfu-Chungking railway.

Shanghai-Nanking Railway.—The following figures of traffic returns (approximately) for the week ended December 13 are issued by the Shanghai-Nanking Railway:—

Year.	Passengers.	Goods and Sundries	Total for the week.
	$	$	$
1913	52,418	11,981	64,399
1912	41,608	9,758	51,366
Increase.	10,810	2,223	13,033
Decrease	—	—	—

For forty-nine weeks.

Year.	Passengers.	Goods and Sundries	Total
	$	$	$
1913	2,326,468	504,344	2,830,812
1912	2,149,199	396,656	2,545,855
Increase.	177,269	107,688	284,957
Decrease	—	—	—

Week ended December 20.

Year.	Passengers.	Goods and Sundries.	Total for the week.
	$	$	$
1913	50,224	11,899	62,123
1912	38,576	8,200	46,767
Increase	11,657	3,699	15,356
Decrease	—	—	—

For fifty weeks.

Year.	Passengers.	Goods and Sundries	Total
	$	$	$
1913....	2,376,692	516,243	2,892,935
1912....	2,187,766	404,856	2,592,622
Increase.	188,926	111,387	300,313
Decrease	—	—	—

Week ended January 3, 1914.

Year.	Passengers.	Goods and Sundries	Total for the week.
	$	$	$
1914....	55,253	8,703	63,956
1913....	48,266	9,486	57,752
Increase.	6,987	—	6,204
Decrease	—	783	—

For twenty-six* weeks, 1913

Year.	Passengers.	Goods and Sundries.	Total.
	$	$	$
1914....	1,239,378	261,437	1,500,815
1912....	1,060,539	248,483	1,309,022
Increase.	178,839	12,954	191,093
Decrease	—	—	—

* Owing to the alteration in the railway's fiscal year the totals to date have been altered to include figures as from July 1, 1913 only.

Week ended January 10.

Year.	Passengers.	Goods and Sundries.	Total for the week.
	$	$	$
1914	55,796	11,147	66,943
1913	49,479	10,531	60,010
Increase.	6,317	616	6,933
Decrease	—	—	—

For twenty-eight weeks.

Year.	Passengers.	Goods and Sundries	Total
1914....	1,295,174	272,584	1,567,758
1913....	1,110,018	259,014	1,369,032
Increase.	185,156	13,570	198,726
Decrease	—	—	—

Week ended January 17.

Year.	Passengers.	Goods & Sundries.	Total for the week.
	$	$	$
1914....	58,059	12,566	70,625
1913....	45,907	9,557	55,464
Increase.	12,152	3,009	15,161
Decrease.	—	—	—

For twenty-nine weeks.

Year.	Passengers.	Goods & Sundries.	Total.
	$	$	$
1914....	1,353,233	285,150	1,638,383
1913....	1,155,925	268,571	1,424,496
Increase	197,308	16,579	213,887
Decrease	—	—	—

MANCHURIA

South Manchuria Railway Co.—It is said that in the programme of readjustments of the South Manchuria Railway Company an item is included to raise a foreign loan next spring to the amount of about 20,000,000 *yen*. A portion of the proceeds of the loan will meet the expenditure for the construction of the Szuping-chieh-Tao-nan-fu line and the remainder will cover the expenditures for the completion of the remaining section of the Kirin-Changchun line and for the surveying work of the Kirin-Hui-ning line. These railway works, however, will be started as several years' continuing undertakings and only a part of the loan will be expended in the first year of those railway undertakings. The remaining sum of the loan, therefore, will be deposited in the National Treasury and it will be diverted for the railway funds required in Japan proper in case of urgent need.

The monthly traffic returns for December last of the S. M. Railway reached Y.2,806,846, being an increase by Y.241,912 on the corresponding month of the present year. The daily average for that month amounted to Y.90,543.

The aggregate traffic receipts since last April wereY.16,075,110,being an increase by Y.3,296,618 over the corresponding period of the previous year.

The *Manchuria Daily News* understands that the S. M. Railway management proposes to increase the passenger service on the Main Line between Dairen and Changchun by a daily through service by the end of the fiscal year 1914, viz., March 31st, 1915 At the same time the capacity of carrying freight is to be raised to the maximum capacity of 8,730 tons per day each way, and the average running mileage of coal trains to 90 miles a day.

The Railway Workshops at Shahokou are going to construct the first locomotives for the S. M. Railway upon materials ordered from England which are arriving at Dairen. Six locomotives will be completed by about next July, each costing about Y36,000, as against Y46,000 for one of English make and Y42,000 for one of American make. As the workmen acquire greater skill in this new line of work, the Workshops management expects to be able to reduce the expense of constructing a locomotive to only about 30 per cent. of the original cost.

The Workshops supplied the whole of materials for the two steel-trussed warehouses for erection at Antung, which cost about Y170,000.

South Manchuria Railway Feeders.—The Chinese gentry of Tiehling, represented by the chairmen of the Prefectural Assembly, the Chinese Guild, and the Town Council, have started a movement to have the western terminus of the proposed railway connecting Hailungcheng with the S. M. Railway shifted from Kaiyuan to Tiehling. It may be remembered that the need of constructing this railway line has been aired since 1909, and the question of the terminal station has remained a matter of bitter rivalry between Tiehling and Kaiyuan. With the recent revival of the railway scheme endorsed by the alleged Sino-Japanese Railway Loan agreement, the leading Chinese merchants of Tiehling have regarded with alarm the possibility of losing the terminal station in project to Kaiyuan.

The Japanese Government is pushing on negotiations for the settlement of minor details in connexion with the concession for the construction of five railways in Manchuria and Mongolia, says the *Asahi*, with a view to starting without delay the work of construction, for which preparations are being made. The other party to the negotiations being the Chinese Government, adds the Osaka journal, the negotiations may not progress so rapidly as is desired by the Japanese Government; but the general arrangements are already made, and the English loan for the Paosing Railway has been signed. In these circumstances, not much difficulty is likely to be experienced in advancing Sino-Japanese negotiations. The construction of railways in Manchuria and Mongolia in winter is difficult, so the Government proposes to start work early next spring. The Taonanfu line will be first constructed to connect Chengchiatun with the South Manchuria Railway, the construction of other lines being taken in hand gradually.

According to the Chinese papers, the Japanese Government has proposed to the Government that two of the four lines conceded to Japan should be changed to run through some of the cities just opened to foreign trade by a Presidential Order, instead of passing through the cities as formerly decided upon. One of the two lines is the Changchun-Taonanfu Railway, which, according to the proposal, is to be started from Tienchiatun in Manchuria, passing through Chihfeng to Dolonor, and from Dolonor through Kalgan to Kweihua by a branch line. The other line is the Taonanfu-Jehol Railway, and the Japanese Government proposes that after reaching Chaoyang, the line, instead of running to Jehol, be changed to

go to Hututao. The Chinese papers comment that if the proposal is approved by the Chinese Government, the Japanese will control these cities commercially.

The *Chung Kuo Kung Pao* says that since the Japanese Government secured the right of building the four railways in Manchuria from China, the Japanese Minister in Peking has made arrangements with the Peking Government as follow :

1. Out of the four lines, the Shih-ping-chieh-Taonan and the Kaiyuan-Hailung lines should be constructed first.

2. The construction works will be entrusted to the South Manchurian Railway Company while the Yokohama Specie Bank will do the financing.

3. The estimated cost of building the two lines is $20,000,000, to be supplied by the aforesaid Bank in two instalments.

4. The construction works will commence in April of this year and finish within six months so that the two lines may be opened to traffic before the end of 1914.

JAPAN

Profitable State Lines.—A responsible official of the Japanese Imperial Railways, quoted by the *Jiji*, remarks that the railway authorities estimated the net profit for the present fiscal year ending March next at Y.15,000,000, but the year's working has been profitable beyond their expectations. Even after deducting various unbudgetted expenses, the net profit for the year promises to show an increase of close upon Y.2,000,000 over the estimate. It is impossible to estimate the revenue for next year on the basis of this rate of increase, so in compiling the railway estimates for next year the net profit has been estimated at Y.17,400,000.

This year the Taisho Exhibition is to be held in Tokyo in the spring, and the Coronation ceremonies are to take place in the autumn. From these and other forthcoming activities a revival in business is anticipated this year, and a net profit of not less than Y.20,000,000 is expected from the railways. An understanding has been come to between the railway Bureau and the Finance Department that the increased profit over the estimates should be used for the expenditure on railway construction and improvement. If the same amount as for the present fiscal year is spared by the Finance Department for the purpose mentioned, the total amount available next year for this purpose will exceed Y.43,000,000. In this way the Imperial Railway authorities hope to be able to carry out the construction of new lines on a large scale.

Railway Extension.—It is understood that the Japanese Railway Board has, after repeated conferences, decided to complete seventeen lines with a combined mileage of 242 during 1914, as detailed below :—

Lines.	Sections.	Mileage.
Shinjo......	Imadegawa-Kajiya	8,63
Taira	Koriyama-Mihoru	7,56
Taira	Taira-Nishiogawa	6,55
Tokushima..	Kamada-Ikeda	25,27
Sendai	Kushikino-Sendai.........	7,33
Shinjo......	Kiyekawa-Sakata.........	15,04
,, (for Freight only)	Sakata—the harbour	1,54
Ganetsu	Nozawa-Tsugawa	19,14
Murakami ..	Shibata-Chujo	8,08
Murakami ..	Chujo-Murakami	12,50
Taira	Mikame-Ono-Shinmachi .	20,66
Hojo	Kisaradzu-Minato	14,62
Hamada	Oda-Ota	10,61
Tadotsu	Kwanonji-Kawanoya	9,62
Sayeki......	Oita-Saisaki	11,58
	LIGHT RAILWAYS.	
Yubetsu	Kakeshibe-Shimokitahara	18,00
Funakawa ..	Nita-Wakimoto	5,24
Nagai	Noshigo-Nagai	9,12
Miyagi	Kumamoto-Otsu	13,70
Miyagi	Otsu-Shimono	10,68
Inukai......	Oita-Nakahanda	7,23
	Total	242,47

CHOSEN (KOREA)

New Railways Open.—The Tajon-Mukpho line in Chosen has been completed and is now open to the public. The work was spread over a period of eleven years in the days of the late Superintendent-General Viscount Sone, but the period was shortened to six years upon the assumption of the Governor-Generalship by Count Terauchi. The line, with Tajon, Wonsan and Mukpho as termini, extends 175 miles and was constructed at a cost of 760,000 *yen*. The completion of this railway is calculated to contribute not a little to the exploitation of the natural resources in the Peninsula, since it runs through the four great fields, namely of Kankyong, Chongju, Kinche and Naju.

SIAM

The Northern Railway.—The British Vice-Consul at Nakawn Lampang (Mr. W. A. R. Wood) reports that he recently journeyed to that place from Chiengmai along the route of the proposed Northern Railway. This line will eventually connect Bangkok with Chiengmai, and is expected to be completed in 1918, but at present it is only open as far as Pak Chan, about 350 miles from Bangkok.

The general direction of the line follows the main caravan route from Phre to Chiengmai, but very considerable detours from it have been made in order to avoid very hilly districts. Consequently the whole route presents no very serious engineering difficulties, although there will be a tunnel 1,350 metres (1,470 yards) long at Khoon Tan, and a short tunnel, about 140 metres (153 yards) long, near Pang Puei. The Khoon Tan tunnel is being bored through practically solid granite, and although work is continuous (day and night) and blastings are made about every four hours, only an average depth of about one yard is excavated each day. Boring is being carried on at both ends on two tunnels, one above the other; the northern end has been excavated for 120 metres (130 yards), and the southern end for about 90 meters (98 yards). At this rate the two ends will not meet for at least 18 months, and it will, of course, be much longer before the upper and lower tunnels are properly joined up. As, however, the railhead is not expected to reach Khoon Tan until late in 1917, the tunnel will probably be completed by the time it is required.

The bridge across the Me Yome river at Pak Chan will not be properly finished until 1914 but, in spite of this, another section of the line—from Pak Chan to Pak Ta—will be open to traffic shortly, and a further section will be opened to Ban Pin about April, 1914.

H.M. Vice-Consul adds that he understands that a road suitable for motor traffic is to be constructed between Nan and Phre at a cost of 200,000 ticals (about £15,400).

Southern State Railways.—Construction work on the Southern Siamese State Railways has proceeded so satisfactorily that it was definitely decided to hand over to the Traffic Department on the 1st January, 1914, on the Trang side: Kao Kao—Tung Sawng Section (km 50—94) and on the Singora side: Singora—Patalung (km 1—90).

From the 1st of January therefore, daily trains for passengers and goods were run on both sides of the Peninsula for about 90 km.

The section Patalung-Ronphiboon-Tung Sawng should be ready at the latest by the 1st July, also the branch-line from Ronphiboon to Nakon Sri Tamarat, so that in about 6 months hence daily through trains should run from Trang via Tung Sawng to two ports on the East Coast of the Peninsula, viz., to Singora and to Nakon Sri Tamarat.

MALAYA

Siam-Federated Malay States System.—The *Bangkok Times* says :—The railway negotiations between Siam and the F.M.S. federal authorities have resulted in the amount available under the Southern Railway loan being increased by £750,000 at the same rate of 4 per cent. and in a decision to link up the Siamese line with the Kedah Railway. We learn from the Ministry of Communications that the Loan had to be increased to build the new line, but we fancy most of the increase will really be needed to complete the original project.

GENERAL

Burmah-China Railway.—At a meeting of the Manchester Chamber of Commerce on December 17 a paper was read by Mr. T. M. Ainscough on the proposed new railway across the Burmah-Chinese frontier from Bhamo to Tengyueh. He strongly advocated the making of the line, both on political and commercial grounds, and said that the development of the province of Yunnan would be advantageous to the trade of Lancashire. The chairman said that a memorial to the India Office had been suggested, but it was thought wise to hold it over until they had heard Mr. Ainscough's paper.

Mr. Ainscough first described the early explorations and commercial missions in this frontier region, and he said that so recently as 1875 adverse reports were made as to the possibility of establishing railway communication. One result of the extension of British rule to the Shan States in 1885 was the construction of the railway to Mandalay. Latter a scheme was formulated for the extension of the line into China by way of Kunlong. In March, 1903, the line was completed to Lashio, but the difficulty of continuing the track was so great no further progress had been made. Subsequently new surveys were made between Bhamo and Talifu—an important trade centre —*via* Tengyueh, and this time it was reported that the construction of a railway was feasible. It was believed that the first section, as far as Tengyueh, could be completed at the cost of £763,000, and that the local traffic would be sufficient to enable a dividend of 2 per cent. to be paid from the start. The remaining section would cost four and a half millions sterling, and the traffic prospects were not so good, but Mr. Ainscough expressed the opinion that a considerable development of trade, especially in cotton yarns and goods, would follow the construction of a railway.

Mr. Ainscough considered also that political reasons alone would justify the project, because France was seeking to extend her trade interests in Yunnan-fu. Another weighty consideration was the fact that goods which entered China by the French railway were subjected to heavy tariffs, which were not imposed on the merchandise entering by way of the existing Bhamo mule track. A great deal would depend on the attitude of the British Government as to the manner in which the scheme would be received by the Chinese authorities, and strong pressure from the British Legation at Peking would be helpful. He suggested that as a preliminary measure representations should be made to the Secretary of State for India setting forth the urgent need for the construction of the railway, both from the point of view of the welfare of Lancashire trade and of the interests of the Empire as a whole.

On January 17 it was reported that the British Government has approached China with reference to the construction of a railway from Burma to Tengyueh and Talifu. If the consent of the Chinese Government is obtained, states Reuter's Agency, it is believed that difficulties will arise with regard to financing and construction of the proposed line owing to the immense difficulties of the country through which the railway would have to pass.

Velfnelisk-Kiakhta Railway.—The branch line of the Siberia Railway running from Velfnelisk to Kiakhta, Mongolia, for 230 *versts*, which it was said would be run under private control, has been placed under Government management. The total estimate for the extension work is 27,000,000 roubles, and 1,000,000 roubles will be appropriated the next fiscal year. This plan of financing the scheme has been approved by the Committee on Communications of the Lower House of the Duma.

The said branch first proposed to run from Kiakhta via Kulon to Changkiakou. But the distance to Changkiakou was found to be unexpectedly long, and therefore the cost to be greater. Furthermore, the country along the line as first proposed is almost desert, and promised no returns in traffic. For this economic reason, it was changed to the present plan.

TRAMWAYS

Peking Tram Co.—Chen Hsuan-chu, the promoter of the Peking Tramway Company, according to the *Peking Daily News*, has been accused of soliciting foreign capital for his company.

The Peking Chamber of Commerce has repeatedly sent petitions to the Ministry of Industry requesting that the Peking Tramway Company be dissolved as it is improperly organized. Minister Chang recently held a conference with the Ministers of the Interior and Communications, at which they discussed this matter. It was decided that the Metropolitan Police Court should be instructed to make investigations and find out whether there was any foundation for the accusations.

The Metropolitan Court has now requested the Chamber of Commerce to produce proofs substantiating the charges against the Tramway Company. The Court also sent a note to Chen Hsuan-chu ordering him to reply to the accusations, and to make full explanations regarding the organization of his company.

The Peking Chamber of Commerce held a meeting recently, which was attended by the delegates from fourteen sections of Peking city. The evidence against the promoter of the Tramway Company was assembled. It was afterwards decided to petition the various Ministries once more.

Accordingly, petitions were addressed to the Cabinet Office, the Ministries of Industry, of the Interior, and of Communications.

Two reasons were given why the Peking Tramway Company should be dissolved, namely :—(1) When the formation of the company was announced, the promoter declared that the construction work would commence six months afterwards, but one year has now elapsed, and yet nothing has been done in this direction. Although a little surveying has been attempted, it cannot be called construction work. (2) This company has never made any visible effort to raise capital among the Chinese merchants, which fact goes to prove that the capital now deposited with the Paoshang Bank, alleged to be more than one half of the total amount, must have come from a foreign source.

Shanghai Tramways.—The returns for the week ended December 17, are as under:—

	1913.	1912.
	$	$
Effective receipts (after deducting loss by depreciation of subsidiary coinage)	17,102.85	14,610.10
Passengers carried	808,390	737,247
Car miles run	56,184	50,878

The loss by depreciation of subsidiary coinage for the week was $4,880.16 equal to 23.51 per cent. of the gross cash collected on the cars as compared with $3,988.18, equal to 22.91 per cent. for the corresponding week last year.

Week ended December 24.

	1913.	1912.
	$	$
Effective receipts (after deducting loss by depreciation of subsidiary coinage)	17,647.08	15,190.67
Passengers carried. . .	920,337	753,588
Car miles run	56,927	50,953

The loss by depreciation of subsidiary coinage for the week was $5,024.90 equal to 23.43 per cent. of the gross cash collected on the cars as compared with $4,108.72 equal to 22.68 per cent. for the corresponding week last year.

Week ended December 31.

	1913.	1912.
	$	$
Effective receipts (after deducting loss by depreciation of subsidiary coinage)	17,749.44	14,455.70
Passengers carried. . .	920,993	704,124
Car miles run	56,927	47,974

The loss by depreciation of subsidiary coinage for the week was $5,023.96 equal to 23.29 per cent. of the gross cash collected on the cars as compared with $3,755.03 equal to 21.97 per cent. for the corresponding week last year.

Week ended January 7, 1914.

	1913.	1012.
	$	$
Effective receipts (after deducting loss by depreciation of subsidiary coinage)	18,290.49	16,153.34
Passenger carried. . . .	936,940	789,972
Car miles run	57,062	51,363

The loss by depreciation of subsidiary coinage for the week was $4,935.68 equal to 22 41 per cent of the gross cash collected on the cars as compared with $3,862.46 equal to 20.34 per cent. for the corresponding week last year.

Week ended January 14.

	1914.	1913.
	$	$
Effective receipts (after deducting loss by depreciation of subsidiary coinage)	18,430.51	14,733.20
Passengers carried . . .	948,802	714,639
Car miles run	57,330	50,489

The loss by depreciation of subsidiary coinage for the week was $4,917.45 equal to 22.26 per cent. of the gross cash collected on the cars as compared with $3,498.77 equal to 20.57 per cent. for the corresponding week last year.

Week ended January 21.

	1914.	1913.
	$	$
Effective receipts (after deducting loss by depreciation of subsidiary coinage)	18,797.08	15,232.78
Passengers carried . . .	971,901	737,034
Car miles run	58,847	49,445

The loss by depreciation of subsidiary coinage for the week was $5,052.25 equal to 22.36 per cent. of the gross cash collected on the cars as compared with $3,646.82, equal to 20 67 per cent. for the corresponding week last year.

Progress of Traffic

Year.	Passengers.	Gross receipts.	Loss by depreciation of subsidiary coinage.	Effective receipts.	Effective receipts per car mile.	Effective receipts per Passenger.
		Mex. $	Mex. $.	Mex. $.	Mex. cents.	Mex. cents.
1908*	7,823,002	344,488	50,812	293,676	19.30	3.75
1909	11,722,715	557,629	116,088	441,541	22.31	3.76
1910	18,751,215	701,282	155,184	546,098	27.36	2.91
1911	27,257,250	805,211	168,848	636,353	28.39	2.33
1912	40,734,233	1,037,206	239,374	797,832	29.04	1.95
1913	47,686,648	1,179,865	258,809	921,055	31.94	1.93

*From March 5.

	Miles. Double	Miles. Single
Length of track unchanged since opening, viz.,	9.16	7.15

Cars:—

	1908	1913
Motors	65	67
Trailers	—	40
	65	107
Motors nearing completion		13
		120

HARBORS

New Dock at Hikojima.—The plan of the dock now being constructed by the Mitsu Bishi Co. at Hikojima, an island in the Shimonoseki Straits, has been extended from 270 feet to 350 feet in length. The extension has been approved by the Kure Port Admiralty. The dock is expected to be completed by June next.

SHIPBUILDING, ETC.

Hongkong and Whampoa Dock Co.—A Hongkong paper reports that the Hongkong and Whampoa Dock Company have just secured the contract for the building of a fine new steamer for the Straits Steamship Company.

The new vessel is to be one of 225 feet between perpendiculars with a beam of 36 feet. Her mean draught will be 9 feet 2 inches. The vessel, which is to be fitted with the latest appliances for loading and unloading cargo, will be provided with all modern conveniences. She will be a single-screw steamer of 11,000 tons horsepower and will have a speed of 11 knots. She will have two single-end boilers and one donkey boiler. The new steamer will have accommodation for 14 first class and 12 second class passengers. She is to be completed in about a year and will be a handsomely fitted vessel in every way.

A Hongkong paper reports that on January 8 the steamer *Tai Lee*, built for the Sze Yap S. S. Co., for service on the Canton and West River traffic by the Hongkong and Whampoa Dock Company, was successfully launched at Kowloon. The *Tai Lee* is a handsomely modelled steel twin-screw steamer classed to the American Bureau of Shipping, A. 1., 20 years, for bay and river service; also to Board of Trade. Her dimensions are 217 feet overall by 38 feet by 21 feet, moulded to main deck, and she will have a deadweight carrying capacity of 300 tons on a light draught. There are three decks, providing ample passenger accommodation; 28 European first-class on the u per and shade decks forward, 47 Chinese first-class amidships, and 158 second-class on the upper deck aft, whilst a large number of deck passengers are carried on the main deck. It may be mentioned that special attention has been given to the European first-class, six special staterooms and a dining saloon being placed at the foremost end of the deck. The position could scarcely be excelled as regards natural ventilation and coolness during the voyage. Throughout, the vessel is fitted with a complete system of electric lighting and fans. The propelling machinery consists of two sets of inverted direct acting, surface condensing, triple expansion engines, having cylinders 15 inch, 24 inch, and 30 inch diameter; stroke 26 inches, steam being supplied at 180 lbs. pressure by two large multitubular marine boilers working under Howden's system of forced draught, which, it is anticipated, will develop sufficient power for the fully laden service speed of 14 knots.

Japanese Activity.—A Japanese trade paper reports that private shipyards in Japan are now fairly busy. The tonnage of the vessels now under construction in different yards, which are eligible for the subsidy granted for the encouragement of shipbuilding, is as given below:—

Yards.	Gross-tonnage.	Owners.
Mitsu Bishi Nagasaki Yard	11,900	N.Y.K
" " "	"	"
Mitsu Bishi Kobe Yard ..	1,500	ready made
Kawasaki Yard	5,700	O.S.K.
"	11,900	N.Y.K.
Osaka Iron Foundry	1,170	O.S.K.
" "	1,550	"
" "	3,200	"
" "	3,200	"
Kuchiki Yard	1,415	"
Uraga Yard	2,200	—

They number 11 with a combined tonnage of 55,631 tons. Besides the N.Y.K. has petitioned the Government for the grant of subsidies on four cargo boats of 7,500 tons each to be built at the Mitsu Bishi Nagasaki Yard, and the Kawasaki Yard; and on two more cargo boats of 9,600 tons each to be ordered from the same yards. Early this year keels will be laid for two super-dreadnoughts of 30,600 tons each at the Kawasaki Shipyard, Kobe, and the Mitsu Bishi Shipyard, Nagasaki.

MINING

Kailan Mining Administration.—The total output of the Administration's mines for the week ended December 6, amounted to 52,034.79 tons, and the sales during the same period to 44,789.81 tons.

Week ended December 13 output 54,070.83 tons, sales, 50,228.58 tons.

Week ended December 20, output 52,878.53 tons, sales, 55,864.92.

Week ended December 27, output 54,263.56 tons, sales 37,397.06 tons.

Week ended January 3, 1914, output 55,297.90 sales 43,782.98 tons.

Week ended January 10, output 54,307.05 tons, sales 51,871.84 tons.

Coal in Iwate, Japan—A report just received is to the effect that a great coal deposit has been discovered in the vicinity of Kuji, Iwate. Although it is an old story that an American resident of Yokohama came across a very rich mine of smokeless coal in the province almost fifteen years ago, the discovery relates to a much bigger one, located some distance from the port of Kuji. This deposit is also of the smokeless kind; and according to chemical analysis, it was great heating power. Mr. Kano, a mining engineer, has ascertained that there are more than twelve rich viens in it, which spread beneath a number of villages there. Another encouraging feature of it is that the exploitation of it will be a very easy matter, because it is in reach of many facilities of shipment. Also, it is stated that the Department of Agriculture and Commerce will soon send official prospectors to make an investigation.

A Kirin Colliery.—A Japanese paper reports that Mr. Chi and Mr. Wang, formerly of the Industrial Guild, Kirin, conjointly with Swiss capitalists, have applied for the concession to operate a colliery at Titaokou in Mishan Prefecture. The capital is to be S. yen 5,000,000, to be produced in equal shares between the Swiss and the Chinese promoters. In case of the Chinese side failing to raise the required amount, it is agreed that the Swiss capitalists shall advance the deficit.

Penchihu Colliery and Mining Co.—The *Manchuria Daily News* reports that the Penchihu Colliery and Mining Co., which is capitalized at $4,000,000 (one-half for the Colliery and the other half for iron mining and steel works) has already completed the foundation work for installing a smelting furnace which is expected to arrive about next July. The new furnace will be brought into service near the end of the current year. The management hopes to refer to the general meeting of the shareholders in the coming spring the proposed further increase of the capital by $2,000,000. One of the chief investments of the new capital will be the installation of a second smelting furnace. The programme of extension will be consummated with the increase of the capital to the total of $8,000,000 and the installation of a third smelting furnace.

FINANCIAL

Industrial Loans in China.—The following regulations have been drawn up by Mr. Chang Chien, Minister of Agriculture and Commerce in conjunction with the Ministries of Foreign Affairs and Finance, concerning the flotation of industrial loans from foreign capitalists in the various Provinces:—

1. Previous to the flotation of any foreign loan for the development of a certain industry, the Chief Civil Administrator of the Province concerned must first report in detail to the Ministry of Agriculture and Commerce about the existing condition of the industrial enterprise, the plans of the borrowers and its future prospects after the entry of foreign money. No negotiations for any foreign loan are permitted until the petitioners have received authority from this Ministry.

2. The amount of the proposed foreign loan should only be sufficient to develop the industry specified in the petition of the borrowers who must present their estimates and prospectus to this Ministry for inspection and approval.

3. Industrial loans should not be used as administrative expenditure by the borrower. Not only this, but the borrowers are not permitted to misappropriate them for any other industrial purposes.

4. Previous to the signature of the draft agreement for any industrial loan, the borrowers must present them to this Ministry for examination in conjunction with the Ministries of Foreign Affairs and of Finance which will give their permission if they find there is nothing objectionable in them. The borrowers can only sign the agreements after they have received permission from the Central Government.

Hongkong and Shanghai Bank.—Subject to audit, the following are the results for the the half-year:

Dividend	£2. 0. 0
Bonus in addition to dividend	£0. 5. 0
Added to Silver Reserve	$200,000
Written off Bank Premises Account.	$300,000
Carried forward to next half year about	$2,050,000

Japan's Foreign Trade.—The Japanese Department of Agriculture and Commerce has published the following figures in regard to the foreign trade in 1913:—

	yen.
Exports	630,345,000
Imports	729,209,000
Excess of Imports	98,864,000

Compared with the previous year the value of exports increased by 105,725,000 yen (20.01%), imports by 110,495,000 yen (17.8%), and the excess of imports by 4,770,000 yen (5.6%).

The totals are given in thousands of yen as follows:—

	1913	1912	Comparison (all increase)
Exports	630,345	524,620	105,725
Imports	729,209	618,714	110,495
Total	1,359,554	1,143,334	216,220
Excess of Imports	98,864	94,094	4,770

Of the exports cotton yarns, fabrics and raw silk showed the largest increases over the previous year, and more or less increase was also observed in copper, timber, coal, refined sugar, fish oil, fancy mattings, umbrellas, earthen-ware, and dried cuttle fish. Refined tea, straw braid (for hat making), matches, waste silk, camphor, and rice have more or less decreased.

Raw cotton, rice, fertilizers, machinery and sugar are the chief increases in the imports, and some increase is seen in wheat, beans, flour, hemp, iron tubes, woollen fabrics, papers, etc., while wool, leather, iron plate, calico, kerosene oil, and nails all decreased compared with the previous year.

The total public debt as it stood at the end of last December was 2,562,422,931.74 yen,—1,067,103,386 yen domestic and 1,495,318,931.74 yen foreign. During the month of December, 90,850 yen was newly borrowed, and 357,449.76 yen redeemed.

Foreign Capital in China.—The *Japan Mail* says:—The Powers have of late been making investments in China in emulation of one another. According to the latest investigation the amount of the capital invested in China by the Powers is as follows:

	Central Loan. Yen.	Local Loan Yen.
Great Britain	374,543,250	23,380,000
Germany	240,763,250	16,000,000
France	147,837,361	4,620,000
Russia	108,837,361	—
Belgium	29,066,666	210,000
U. S. A.	16,000,000	37,380,000
Japan	69,670,000	2,420,000
Other countries	643,154,840	11,870,000

(We do not vouch for the accuracy of these figures.—*Ed.* F. E. R.)

Japan's Foreign Loans.—The Japanese railway loans negotiated in London and Paris last year to the amount of Y.10,000,000 fall due on March 14 next, and the Government has been sounding the financial position in Europe through the Franco-Japanese Bank and Mr. Mori, the Japanese Financial Commissioner in London. The *Osaka Mainichi* states that the Government has entered upon negotiations for the conversion of the railway loans, and also for a loan to the Japan Hypothec Bank. A syndicate of French capitalists has agreed to undertake the issue of bonds for Y.55,000,000—Y.15,000,000 for the Hypothec Bank and Y.40,000,000 for the railway fund. Some of the terms of the issue still remain unsettled, and the bonds may not be on the market before the middle of March.

Reported Sinkiang Loan.—A Peking paper reports that Tutuh Yang of Sinkiang with the sanction of the Government and the endorsement of the Provincial Assembly, signed a temporary agreement for a new loan of $15,000,000 with representatives of London bankers.

The loan agreement consists of seventeen Articles, the most important of which are as follow:—

(1). Within the month after the formal agreement is signed, one-tenth of the whole amount will be delivered, and the balance will be delivered in three instalments within six months.

(2). The said loan shall be invested in mine developing, land opening and in promotion of industrial enterprises, and not be turned towards the Executive expenses.

(3). Net proceeds, 92.

(4). Interest, 6 per cent. per year.

(5). Securities, the Domestic Animal Tax of the whole province of Sinkiang amounting to 700,000 dollars. If the said Tax is found not sufficient, the deficiency will be met with other taxes.

COMPANIES

Japan Gas Co.—The following are the accounts for the last term:—

Net profits for the term	Y 41,696.97
Brought over from last account	22,467.55
Total	64,164.53
To be distributed:—	
Legal reserve	2,100.00
Bonuses for directors and auditors	4,000.00
Pension reserve	1,000.00
Sinking fund for fixed capital, etc	10,000.00
Dividend at 8 per cent	36,000.00
Carried forwcd to next account	11,064.53

Tokyo Muslin Co.—The profits made for the last term were distributed as follows:—

Net profits for the term	Y216,264.09
Legal reserve	10,000.00
Loss reserve	20,000.00
Dividend equalization fund	10,000.00
Bonuses for directors and auditors	18,500.00
Dividend at 10 per cent.	75,000.00
Special dividend at 2 per cent.	15,000.00
Carried forward to next account	27,764.00

Dai Nippon Sugar Refining Co.—The following are the accounts for the last term:—

Net profit for the term	Y 1,114,812
Brought over from last account	519,373
Total	1,634,185
To be distributed:—	
Legal reserve	60,000
Secondary reserve	250,000
Fund for depreciation in Dairi factory	250,000
Pension reserve	15,000
Bonuses	85,000
Dividend at 8 per cent.	444,000
Carried forward to next account	530,185

Kinugawa Japan Water Power Co.—The following are the accounts for the last term;—

Net profits for the term	Y. 357,634.94
Brought over from last account	28,477.47
Total	386,112.41
To be distributed:—	
Legal reserve	18,000.00
Loss reserve	18,000.00
Bonuses for directors and auditors	17,000.00
Dividend at 7 per cent.	303,750.00
Carried forward to next account	29,362.41

Brazilian Immigration Co. (Japan).—During the last term the profit made totalled Y 6,077.58, which has been carried forward to next account.

Tokyo Rice and Commodities Exchange.—The profits made for the last term were distributed as follows:—

Net profits for the term	Y.140,471.16
Brought over from last account	4,957.24
Total	145,428.40
Loss reserve	7,300.00
Bonuses for directors aud auditors.	7,250.00
Dividend at 11½ per cent.	120,600.00
Carried forward to next account	1,278.40

Sino-Japanese Cotton Spinning Co.—The following are the accounts for the last term:—

Net profits for the term	Y 200,400.00
Brought over from last account	75,000.00
Total	275,400.00

This latter amount is to be disposed of in the following manner:—

Legal reserve	12,000.00
Secondary reserve	22,000.00
Bonuses for directors and auditors	10,000.00
Dividend at 8 per cent.	140,000.00
Carried forward to next account	91,400.00

Hakodate (Japan) Water Power Co.—The following are the accounts for the last term:—

Net profits for the term	Y. 104,541.86
Brought over from last account	13,542.07
Total	118,083.93
To be distributed:—	
Loss reserve	5,228.00
Secondary reserve	10,455.00
Bonuses for directors and auditors	8,900.00
Dividend at 10 per cent.	66,250.00
Carried forward to next account	27,250.93

Sino-Japanese Flour Milling Co.—The following are the accounts for the last term:—

Net profits for the term	Y 68,179.58
Brought over from last account	42,027.87
Total	110,207.45
Legal reserve	3,500.00
Loss reserve	10,000.00
Bonuses	5,500.00
Dividend at 10 per cent.	56,300.00
Carried forward to next account	34,907.45

Japan Paint Manufacturing Co.—The following are the accounts for the last term:—

Net profits for the term	Y 118,354.00
Brought over from last account	36,127.00
Total	154,481.00
To be distributed:—	
Legal reserve	5,918.00
Sinking fund for fixed capital	20,000.00
Bonuses	11,835.00
Dividend at 16 per cent.	88,000.00
Carried to next eccount	28,728.00

Katsuragawa (Japan) Water Power Co.—The following is the profit and loss account for the last term:—

Net profit for the term	Y 170,691.93
To be distributed:—	
Reserve	8,550.00
Secondary Reserve	8,550.00
Bonuses for directors, auditors and downward	5,000.00
Dividend at 5 per cent.	140,000.00
Sinking fund for promotion expenses	7,826.15
Carried forward to next account	765.77

Culty Dairy Co., Ltd. (Shanghai).—The profit and loss account for the year ended October, 31, 1913, showed a profits on the year's working of Taels 16,930.71. After writing off the loss on last year's account, amounting to Taels 9,087.37. Discount to Shareholders on their milk bills of Taels 1,367.47, and making full provision for bad and doubtful debts, there was a balance of Taels 4,217.32, which was dealt with as follows:—

To write off 10% Depreciation on Buildings Account	1,686.48
To write off 20% Depreciation Dairy Accessories Account	953.14
To carry forward to next year's account	1,577.70

Japan Cotton Spinning Co.—The following is the profit and loss account for the last term:—

Net profits for the term	Y 450,736.00
Brought over from last account	118,736.00
Total	569,472.00
To be distributed:—	
Sinking fund for fixed capital	120,315.00
Bonuses	45,000.00
Reserve	60,000.00
Dividend	220,000.00
Carried forward to next account	124,152.00

Fukushima (Japan) Cotton Spinning Co.—The following is the profit and loss account for the last term:—

Net profits for the term	Y 489,666.00
Brought over from last account	194,403.00
Total	684,069.00
To be distributed:—	
Reserve for depreciation in the property	120,000.00
Bonuses for directors and auditors	24,000 00
Reserve	100,000.00
Loss reserve	50,000.00
Fund for the protection of operatives	10,000.00
Dividend at 26 per cent.	176,312.50
Carried forward to next account	203,757.00

Eastern Smelting Co., Ltd., Penang.—The Penang Board of Directors have received cabled advices from the Directors of the Company in London as follows:—

The net profit earned by the Company for the year ended 31st August 1913 is		£25,693
to which must be added the balance of Appropriation Account for the previous year		28,053
		£53,746
After deducting		
Dividend paid last year	£18,000	
Bonuses paid last year	1,838	
Depreciation to 31st August 1913	4,450	
Income Tax for year ending 31.8.13	1,214	
Interin Dividend of 1/- (5%) paid on the Preferred Ordinary Shares on 26th August 1913	2,500	28,002
There remains a balance of		£25,744

The Directors did not advise the declaration of a dividend on the ordinary shares. A final dividend on the Preference Shares at the rate of 1/- per share (5 per cent.), less Income Tax would be payable on the 2nd January, 1914 This would absorb £2,500, and consequently there would be a balance of £23,244 to be carried farward to next account.

Kung Yik Cotton Spinning and Weaving Co., Ltd.—The Consulting Committee of this Company, decided that the shareholders should be recommended to apportion the balance at credit of Profit and Loss account on November 30, 1913, of Tls. 195,399.40 as follows:—

	Tls.
To pay a dividend of Tls. 1.50 per share on 75,000 shares	112,500.00
„ write off Buildings	10,000.00
„ write off Plant and Machinery	25,000.00
„ write off Furniture	282.97
„ place to Equalization of Dividend Account	37,500.00
„ pay a Bonus to Staff at Mill	1,500.00
„ carry forward to new account	8,616.43
Tls	195,399.40

New Philippine Incorporations—A company has been formed at Manila under the name of The First Manila Hat and Umbrella Factories" with a capital stock of P.800,000 divided into 6,000 shares of preferred stock at a par value of P.50 each, and 5,000 shares of common stock at a par value of P.100 each. Of the capital stock P.550,000 worth has been subscribed to and fully paid in P.250,000 being preferred and P.300,000 common. The organizers and stockholders are H. A. *Gsell*, of Paris, and Carlos Gsell of Manila, who hold P.125,000 worth of preferred stock and 149,000 worth of common stock each, Charles Ott, who has P.17,000 of common stock, and G. K. Lingler, M. Geissmann, and F. A. Kretzschmar, with one share of common stock each. According to the incorporation papers, the interest on the preferred stock shall not exceed nine per cent. per annum. Profits will be apportioned among the preferred stockholders first. Should any be left after such distribution they will be divided among holders of common stock pro rata. In case of liquidation, the assets of the company will be first applied to the holders of preferred stock.

PANAMA-PACIFIC INTERNATIONAL EXPOSITION.

Rapid Progress of Construction Work.

A correspondent writing from San Francisco says:—

Ten huge exhibit palaces are under construction at the grounds of the Panama-Pacific Exposition. Between 3,500 and 4,000 men are employed. Hundreds of teams are scattered over the site. The exposition management operates its own railway throughout the grounds and steamers are kept busy delivering lumber to awaiting freight cars. Twenty million feet of lumber are already piled upon the grounds or are in place in the buildings. The main exhibit palaces will alone require sixty million feet of lumber. Despite the magnitude of the work the observant visitor may note the advance in construction each working day. The buildings are assembled upon a schedule that will bring them to completion months before the formal opening of the exposition on February 20, 1915.

At the Golden Gate, a distance of two miles from the center of the site, the huge dimensions of the exposition palaces are becoming evident. The architects planned the exhibit buildings to scale with the lofty hills embracing the site upon the south, east and west. To-day a wonderful massing of exhibit buildings, a vast Oriental city, facing north and San Francisco harbor for 4,500 feet, is rising on the crescent inside the Golden Gate. Before many weeks the exposition site will be covered with a mass of towering structures, increasing in height and area daily and culminating in the great Tower of Jewels, which will rise to a height of 430 feet, dominating the entire group of the main exhibit palaces.

Of the eleven principal buildings in the main exhibit group the huge palaces of Machinery, Fine Arts, Education, Liberal Arts, Manufactures, Varied Industries, Mines, Transportation, Agriculture, and Food Product are under construction. Bids have been let for the Palace of Horticulture, one of the most unique structures in the world, to be built almost entirely of glass, covering five acres and surmounted by a dome 165 feet in height. Wonderful plants and flowers from many parts of the globe will be exhibited in this building. The management has offered a prize of $1,000 for the best rose to be especially produced for exhibition.

The site is being prepared for the great Festival Hall, which will lie in the southern part of the grounds, between the Palace of Horticulture and the Service building. All that portion of the grounds is alive with men, animals and implements engaged in grading.

Bids will soon be called for the construction of the California building, the large and handsome structure, in the Old Spanish Mission style of architecture, which will occupy the site of the old Harbor View baths, close to the bay shore. This will be one of the most imposing structures of the main exhibit buildings.

The contracts have been awarded for the steel work and for the excavation for the Auditorium, in the New San Francisco civic center, between Van Ness Avenue, Hayes, Locust and Leavenworth streets, and work is now in progress upon these contracts. Bids for the actual erection of the Auditorium will be opened shortly.

The landscape gardening is going on apace, large areas of green sward being now seen where once there were sand dunes or the waters of the bay. The trees, shrubs and plants brought from many parts of the globe for the vast gardens about the buildings and in the exposition parks, esplanade and courts, are becoming more numerous and sturdy every day. These are at present in their temporary resting places at the Presidio nurseries and green houses, and in certain spots on the exposition grounds, ready to be transplanted to their permanent abiding places.

The exposition has its own freight ferry slip, at the foot of Buchanan street, completed and now in operation, conveying cars loaded with material, from the car floats to the exposition's own railroad tracks, which already are advanced nearly the whole length of the grounds, with sidings and switches being added rapidly. Locomotives will soon be put on these tracks, which are of standard gauge, and then the freight cars will be sent back and forth as needed, greatly expediting the work of construction, and, later, the conveyance and installation of exhibits. A heavy force is at work grading the site of the car yards, just east of the Palace of Machinery.

Work will be commenced shortly on the passenger ferry slip, which adjoins that for freight, opposite the Army Transport docks, at Fork Mason.

The yacht and boat harbor, at the foot of Scott street, is completed, and is in use by the steamers and other coastwise craft bringing lumber and other material. Sometimes as many as half a dozen steamers are moored at one time to the yacht harbor wharves.

When the exposition is ended, this harbor, and the ferry slips belonging to the exposition, will revert to the city of San Francisco, forming a valuable addition to the city's docking facilities, for they are of best construction, of durable material.

The reparation of the ornamental statuary and other sculpture for the exhibit palaces is progressing so rapidly that A. Stirling Calder, the supervising sculptor, has had to have another large corrugated iron studio built for his corps of assistants. Some of this sculpture, of heroic size, is now temporarily placed out of doors by the west side of the first studio. The staff work for the various palaces is being made rapidly within the buildings themselves or by their sides, in small frame houses and sheds. There will be no delay in the applications of the staff work and sculpture.

An immense amount of work has been done that is not visible to the eye. Such have been the installation of the high pressure water system for fire protection, the low pressure service water system, the underground electric conduits and wiring, the drainage systems, road building and fertilization of the sandy soil by application of rich soil and guano. Work of this character has been extremely laborious and prolonged, in view of the fact that 625 acres of land had to be drained, watered and provided with electricity for power and light. Seventy-one acres had to be reclaimed from the tide-land of the bay.

In the concessions district of the exposition site there is now nearly completed the first of the four fire stations that the exposition will maintain, properly manned and equipped with apparatus of the latest motor-driven pattern. At the present time, there is a temporary fire house at the south side of the main group of exhibit palaces, equipped with apparatus furnished by the San Francisco fire department. There are many hand chemical engines on the grounds, and the high pressure water system is in operation, but not yet fully completed.

Electric power is now being provided all over the area occupied by the sites of exhibit buildings now in course of construction, and it is being added to constantly.

More progress has been made in the preparations for the Panama-Pacific International Exposition than was made at a corresponding stage at any previous international exposition. Added to this is the fact that the climate of California, with no very warm days and no very cold ones throughout the year, permits perennial work, without cessation, which is not the case in other localities, and gives added assurance that February 20, 1915, will see every structure completed and every exhibit in place, ready for the opening of the exposition gates.

PERSONAL

Colonel James A. Irons has recently been appointed Military Attaché to the American Embassy in Tokio to fill the vacancy created by the death of Major Wigmore. The new military attaché was to arrive in Japan some time in January. Col. Irons was in Japan as attaché to Mr. O'Brien, the former Ambassador.

Mr. John Carey Hall, C.M.G., I.S.O., British Consul-General in Yokohama, has retired from the Consular service after forty-six years' work in China and Japan.

The Hon. W. W. Rockhill, formerly American Minister at Peking arrived in the Chinese Capital on January 17.

Mr. A. H. Lay, British Acting Consul-General at Kobe, will succeed Mr. A. M. Chalmers, who has been transferred to Yokohama.

Mr. James J. Rafferty has been appointed Collector of Inland Revenue for the Philippines.

Lord ffrench will arrive in Peking on February 14, accompanied by Lady ffrench. He will also have with him Messrs. Carter and Tristram, railway engineers, who will make a reconnaisance of the Shasi-Shingyi railway.

Mr. Lo Chong, who for some years past has been connected with the Ministry of Communications, and has latterly been chief secretary to the Minister, has been transferred to Tsinanfu, the capital of Shantung province, as Commissioner of Foreign Affairs. Mr. Lo was educated at Oxford, and is possessed of capacity and tact that will enable him yet to distinguish himself in the service of his country. Mrs. Lo is also foreign aducated, and is the daughter of the distinguished reformer Kang Yu-wei, who is famous for the efforts he made in 1898 to bring reforms into the land through the medium of the late Emperor. Those efforts brought about the coup d'etat, which led to the virtual imprisonment of the Emperor by the old Dowager Empress, the execution of many reformers, and the flight and exile of Mr. Kang Yu-wei.

Mr. Satejjiro Odagaki, the new Manager at Shanghai of the Mitsui Bussan Kaisha (Mitsui and Co., Ltd.), arrived at Shanghai on January 16.

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Samuel & Co., Ltd.
Tulloch & Co.

Mechanical Rubber Goods
F. Reddaway & Co.

Mill Machinery
Rose Downs & Thompson Ltd.
Shanghai Dock & Engineering Co., Ltd.
A. F. Craig & Co., Ltd.
E. R. & F. Turner

Mining Machinery
American Trading Co.
Melchers & Co.
Shanghai Dock & Engineering Co., Ltd.
Shewan, Tomes & Co.
New York Engineering Co.

Mineral Oil Plants & Machinery
A. F. Craig & Co.

Motors
Shanghai D ck & Engineering Co., Ltd.
Pratt's

Motor Tyres
F. Reddaway & Co.

Motor Launches
Shanghai Dock & Engineering Co., Ltd.

Paints Oils and Varnish
Standard Oil
Albany Lubricating Co.
F. A. Vander Loo & Co.
J. Dampney & Co.

Packings
F. Reddaway & Co.
Greene Tweed & Co.

Pulleys (Steel)
Schuchardt & Schütte
Shanghai Machine Co.
Shanghai Dock & Engineering Co., Ltd.

Pumps
The Goulds Manufacturing Co.
Shewan, Tomes & Co.
Jardine, Matheson & Co.
Shanghai Machine Co.
Shanghai Dock & Engineering Co., Ltd.
Joseph Evans & Sons

Railroads
Chinese Government Railways
Manila Railroad Co.
South Manchuria
Southern Pacific Co.
Chosen (Korea) Railways.

Railroad Supplies
American Trading Co.
American Locomotive Co.
Andersen, Meyer & Co.
Arnhold, Karberg & Co.
Baldwin Locomotive Work.
Fearon, Daniel & Co.
Hannoversche Maschinenbau A. G. Vormals Georg Egestorff.
Henschel & Sohn.
P. Herbrand & Co.
Jardine, Matheson & Co., Ltd.
Melchers & Co.
Mitsui Bussan Kaisha
Shewan, Tomes & Co.
Shanghai Machine Co.
Shanghai Dock & Engineering Co., Ltd.
Tyer & Co.
U. S. Steel Products Co.
Railway Signal Co., Ltd., The
Robert Dollar Co.
Samuel & Co., Ltd.
Dick, Kerr & Co., Ltd.
Avonside Engine Co., Ltd.
Siemssen & Co.
T. H. Symington Co.

Reinforced Concrete Construction
Shanghai Dock & Engineering Co., Ltd.
Trussed Concrete Steel Co.
U. S. Steel Products Co.

Roofing Paper
California Manila Lumber Commercial Co

Rope Manufacturers
Johnson-Pickett Rope Co.
U. S. Steel Products Co.
Ynchausti & Co.
Shewan Tomes & Co.

Ship-Chandlery
Ynchausti & Co.

Shipping Agents
Cia. General de Tabacos
Shewan, Tomes & Co.
Stevenson & Co., Ltd.

Shipbuilding and Repairs
Fiat-san Giorgio Ltd.
Tsingtauer Werft
Hongkong & Whampoa Dock Co., Ltd.
Kiangnan Dock and Engineering Co., Ltd.
Mitsu Bishi Dock and Engineering Works
Shanghai Dock and Engineering Co., Ltd.
Smith's Dock Co., Ltd.
The Taikoo Dockyard and Engineering Company of Hongkong, Limited
William Cramp & Sons.

Steamship Companies
Cia. General de Tabacos
Pacific Mail S. S. Co.
Ynchausti & Co.
Toyo Kisen Kaisha.

Steel Manufacturers
United States Steel Products Export Co

Steel Works
Bohler Bros. & Co., Ltd.
U. S. Steel Products Co.

Stokers
Babcock & Wilcox Ltd.

Structural Steel
Bohler Bros. & Co.
Shanghai Dock & Engineering Co., Ltd.
U. S. Steel Products Co.

Sugar Machinery
Honolulu Iron Works.
A. F. Craig & Co.

Superheaters
Babcock & Wilcox Ltd.

Tanks
Pacific Tank and Pipe Co.
Shanghai Dock & Engineering Co., Ltd.
U. S. Steel Products Co.
A. F. Craig & Co.

Telephones
The Western Electric Co.

Textile Machinery
A. F. Craig & Co.

Tiles and Bricks
Green Island Cement Co., Ltd.
Chinese Eng. Mining Co.

Tobacco Dealers
British-American Tobacco Co., Ltd.
Cia. General de Tabacos
Olsen & Co., Walter E.

Tools
American Tool Works Co.
Lodge & Shipley Machine Tool Co.
Shanghai Machine Co.
Easterbrook Allcard & Co., Ltd.
The Selson Engineering Co., Ltd.
Shanghai Dock & Engineering Co., Ltd.

Windmills
Defiance Machine Works.

Water Softeners
Babcock & Wilcox Ltd.

Wood Working Machinery
American Tool Works Co.
Defiance Machine Works.
Lodge & Shipley Machine Tool Co.
Shanghai Dock & Engineering Co., Ltd.

THE FAR EASTERN REVIEW

COMMERCE :-: ENGINEERING :-: FINANCE

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THE PROJECTED RAILWAYS IN SZECHUAN, YUNNAN, AND KWEICHOW PROVINCES

OPENING CHINA'S WEALTHY MOUNTAIN-LOCKED PROVINCES.

Whatever bearing international politics in railways may have upon the ultimate dominance of western China as embodied in the rich and practically undeveloped provinces of Szechuan, Yunnan and Kweichow, the fact stands out prominent and undeniable that no matter how or by what financial agency railways are built they will be of immense importance in the opening of the resources of the region and be of incalculable benefit to the people in solving their economic problems. Therefore it may not be uninteresting to devote a little attention to this aspect of the great advance towards the destruction of the isolation of "out-back" China that is now being signalised by the granting of rights for the construction of railways into the three provinces and the linking of their capital cities.

The Chinese people and Government have vigorously resisted years of pressure to permit railways to be built with foreign capital into Szechuan province in particular, fearing—and the as yet unborn years might substantially demonstrate that there were solid grounds for apprehensions—that such a thing would augur the loss to China of a province which easily might be developed into a veritable self-contained kingdom. For Yunnan and Kweichow they have not entertained the same regard. Although Yunnan in particular had through the ages supplied the silver, the copper and much of the gold for the use of the Throne and the Government it was not as near to the officials of Peking as Szechuan. More Szechuanese, with their wonderful stories, came down that great and only artery of communication, the Yangtsze-kiang, and Peking officials who braved the terrifying rapids of the upper part of the rivers elected to take for granted what existed on the southern side of the mass of mountains marking the region, and content themselves with any stories that might be told them while enjoying the ease and comforts that could be secured in the great cities of Szechuan. Tales of the wealth of Szechuan thus substantiated by officials were therefore received with greater credence in Peking, and while it was known that Yunnan, the "cloudy south," and Kweichow, the "precious region," contained treasures which men risked their lives and endured long exile from the centres of civilisation and learning to secure, the provinces were not appreciated so much as was the one of the "four rivers." And, further, Szechuan, being by far the largest of the 18 provinces which constituted China Proper, having an area of 218,533 miles, and a population estimated at over 50,000,000, loomed larger in the official imagination. Yunnan contains but 146,718 square miles, with an estimate of 8,500,000 inhabitants, while Kweichow is still smaller with 67,182 square miles and 7,300,000 inhabitants.

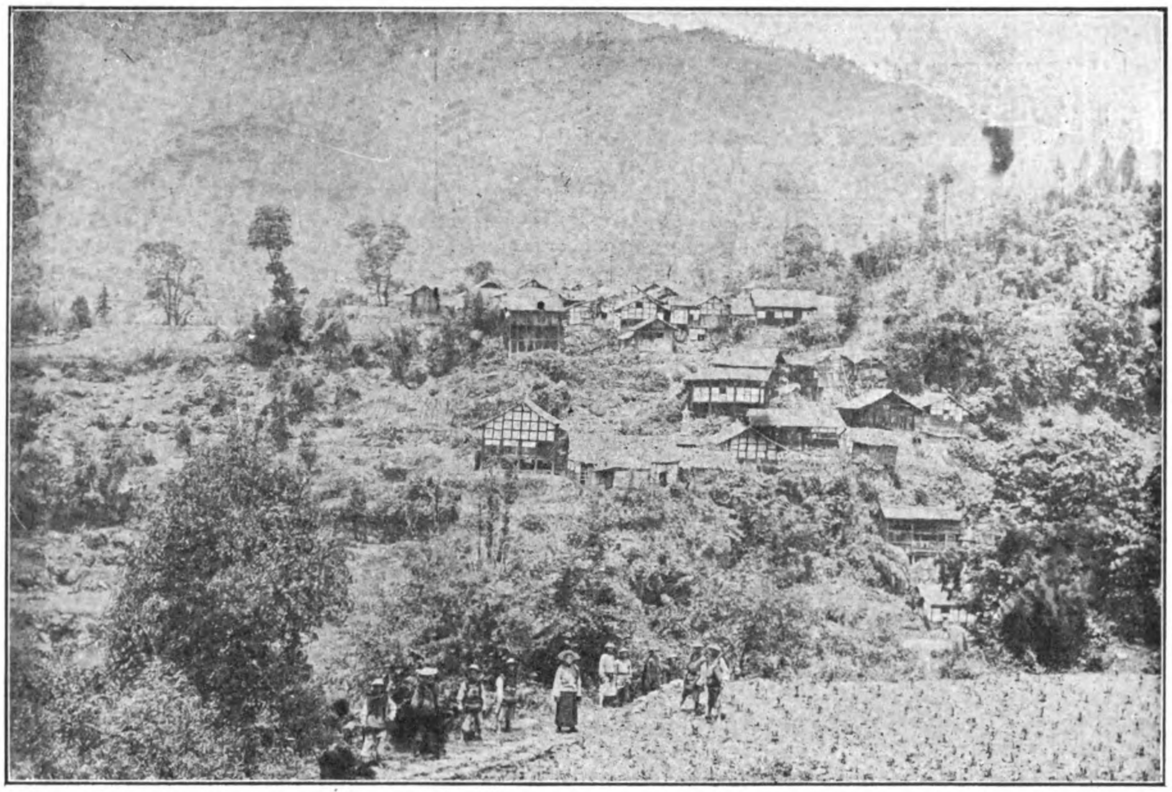
A corner on the Ichang Gorge at High River, Upper Yangtsze.

Primarily, of course, the natural physical conformation of the three provinces was the chief bar to mutual familiarity developing between what might be called the mountaineers and the peoples of the great plains extending eastward to the sea. The easiest avenue of approach from the east was by way of the Yangtsze, and then over ceaseless mountains. The turbulent wall of water, which tumbles through the gorges and which has to be climbed from Ichang upwards into Szechuan, was sufficient to deter any but those who could not avoid it, or who anticipated great benefits, from making the journey, while the difficulties and the hardships of overland travel into Kweichow and Yunnan kept them practically isolated from the other parts of the world. It was only the hardy and the adventurous in the plains who could undertake a return journey, while with the exception of traders, the inhabitants of the plateaux, though capable of great endurance, seldom travelled towards the sea, though they maintained unceasing intercourse with each other, journeying either by river, where possible, or on foot, with pack animals carrying their belongings. Between the inhabitants of Szechuan, Yunnan, and Kweichow there are many characteristics in common, and the conditions of life bear close resemblance. Climatically, too, there is similarity, and they are as alike in their fogginess as they are generally in their isolation.

The routes mostly followed by the trading men of the plains to Szechuan and the north of Yunnan and Kweichow were by way of the Yangtsze ; to central Kweichow by way of the Mandarin

road from Changsha in Hunan, up the Yuan river valley and over the mountains to Kweiyang, the capital ; and to central Yunnan by way of the rivers from Canton and by mountain paths to Yunnanfu, or from Indo-China either up the Red River, or over the mountains. All these journeys were tedious and long. But the routes selected and traversed for centuries are those which were the easiest, and which, difficult as they are, will in a measure furnish the routes for the railways that now are to be laid to annihilate distance, time, and heart-breaking mountain barriers. Though most of the rivers of Yunnan and Kweichow are not navigable, they will, to a tremendous extent, facilitate railway construction, for it will be through their tortuous valleys that the engineers will be able to locate the lines which will eventually carry the trains of civilisation and modern economic benefits into the mountain locked region.

Of the difficulties of establishing railway communication much might be written. Szechuan is virtually covered with high mountains interspersed with rich valleys. In the east the chains run in a north-easterly and south-westerly direction rising to 6,000 feet: then the great Red Basin containing the rich plain of Chengtu, the capital, with an elevation from 650 to 1,900 feet above the sea, broken by confused hills rising to 2,000 feet above the plains, leads westwards towards Tibet, which is cut off by massive ranges up to 19,000 feet high, and northward to chains up to 8,000 feet which form the boundary of Kansu province. In the mountain area high peaks, gorges and chasms, and long, roaring torrents are the feature : on the plains the fertility, the irrigation, the primitive methods of mining, and the industry in agriculture of the population are the chief characteristics which attract the observer.



Yunghsien District, near Yachow, Szechuan

The latter conditions are similar on the high tablelands of Yunnan and Kweichow, though both possess the additional advantage in some respects of a torrid and tropical climate. Yunnan is, however, more distinctive than Kweichow in its climatic varieties. Where it marches with Tibet the lofty mountains are covered with perpetual snow, and are cleft by deep gorges filled with heavy and suffocating air, but to the east the bulk of the region is composed of plains with an altitude of 6,000 feet, and hills rising another 3,000 or 4,000 feet above them. Near the Yangtsze there are high peaks, gorges and deep chasms, with a sparse population, and a damp, unhealthy climate. In the south there is tropical verdure, and to the east there are "large and verdant plains, now encircled with boundless horizons, now studded with mounds and hills, but everywhere abounding in marshes, lakes and rivers. The sky is pure, the temperature mild and pleasant, while the population is concentrated in the valleys and near the lakes." In the limestone regions fir-trees cover the mountains, while in those of schist formation splendid forests abound. In the north-east on the boundary of Kweichow is a broken mass which extends well into Kweichow.

Sugar loaf peaks characterise the mountain masses of Kweichow, which is also a great tableland, with a mean altitude of 4,200 feet, the valleys in the south-west, however, attaining an elevation of 6,500 feet above the sea, the peaks rising to 9,000 feet. Basin-shaped depressions mark the tableland, which is intersected by rivers running torrentially in narrow and deep gorges. Abruptly it descends on the south and, again to use the words of Pere L. Richard "it is through a series of steps that a passage is effected from one valley to another." The Chinese proverb has it that seventh-tenths of Kweichow province are mountains, though they are less elevated than Yunnan and the climate is less healthy. Likewise Kweichow differs from Yunnan in that it has not the lakes and rivers, and its soil lacks the fertility of its south-western neighbor. In general, while the physical conditions of Kweichow have compelled observers to describe them as a "sea of mountains," those of Yunnan have been likened to "an immense staircase" in the north-east, while in the west and south they form "a vast field furrowed with long and deep ravines."

Thus, then, the orographic character of Szechuan, Kweichow, and Yunnan is the chief barrier to railway communication, and has been for ages the reason for the comparative isolation of those three provinces. But the engineer with modern methods can overcome the natual obstacles, and is at work overcoming them, the only question to be considered in the task being—cost.

All construction work will be difficult, cutting, tunnelling, and bridging, though more of the two former than the latter, and costs of operation will be determined by the gradients. Plateaux have to be scaled in each province, but the great obstacles are the cross mountains, the deep gorges and rocky chasms, which combine in making the finding of levels difficult.

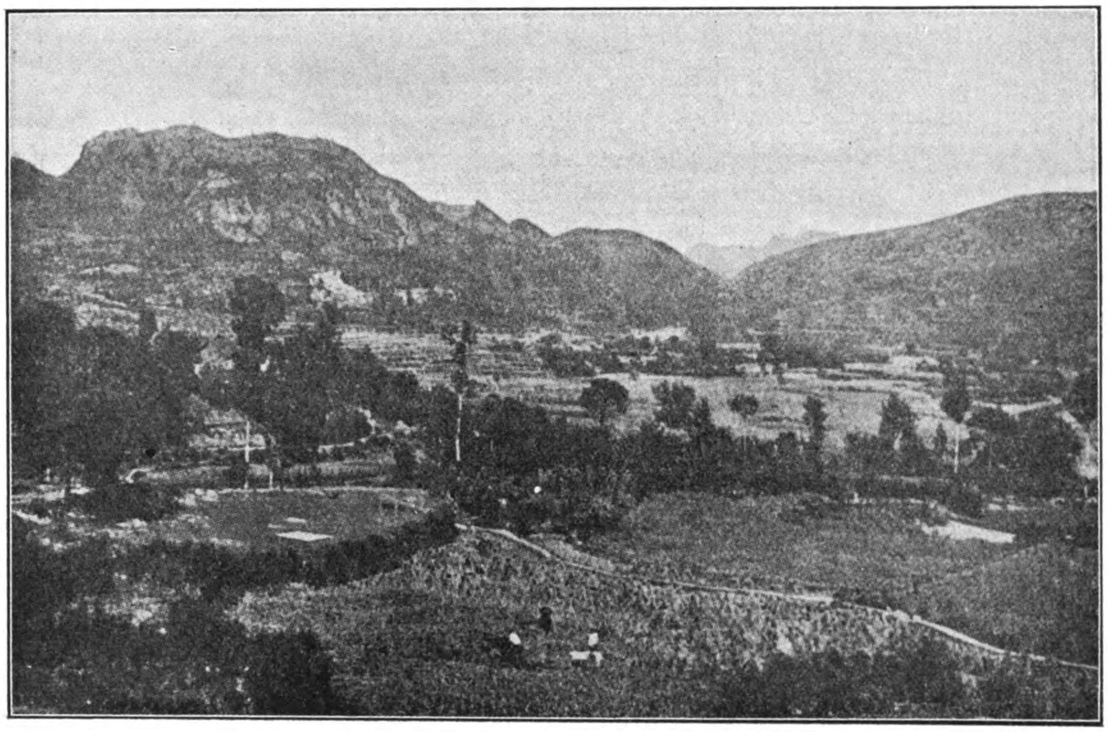
Major Davies, in his report on a reconnaissance from Burma to the Yangtsze estimated that a metre gauge railway would cost for the 1,000 miles from £15,000,000 to £20,000,000. This line run would run from the Kunlong ferry to Suifu, on the Yangtsze, via Yunnanfu, and traverse difficult country, necessitating at times a grade of one in 25, with possibly a few short lengths of rack. The heaviest of the grades are encountered near the Yangtsze, a section over which the line to connect Chungking with Yunnanfu must run.

The cost of the 288 miles of the railway which runs through Yunnan and connects Indo-China with Yunnanfu, was £6,600,000, according to official figures. Other authorities place it higher, but the tremendous difficulties encountered in building this railway will be repeated on whatever line is brought into the province from any other direction. Apart from the immense task of mounting the plateau and penetrating the ultimate

appalling gorges set before the French engineers for solution, the death rate among the workmen who had to toil in the jungle fastnesses of the fever laden Namti Valley was terrible, and the labor problem was almost as great as the physical obstructions. On the Yangtsze side of the province fever is likewise to be feared and, also, it may be expected when work is being done—if it is undertaken—on the line from the West River valley, on the south-east.

Mr. K. S. Low, who surveyed this route from Poseh considers that it will cost to build the 435 miles from that place to Yunnanfu some $51,000,000 (about £6,375,000). On the railway now in course of construction from Hankow to Szechuan along the Yangtsze it is estimated that it will cost anything from £15,000 to £20,000 per mile. It is to be said, however, that so far no engineer's report has been made on the line.

Thus we are able to get a fair idea of the cost per mile of entering Szechuan and Yunnan from four different routes, and those figures might also be applied to Kweichow, though Mr. H. C. Carter and staff of engineers who are now making a reconnaissance over the line from Shasi, on the Yangtsze, to Shingyifu, in the southwest of Kweichow province, will furnish an estimate in a few months which will settle any doubts so far as that route is concerned.



A Scene in Kweichow, near Panghai

The lines which China has contracted to build in Szechuan, Yunnan and Kweichow are as follow:—

From Hankow to Chengtu, via Chungking approximately	1,100 miles
From Chungking to Yunnanfu, approximately	570 ,,
From Yunnanfu to Yamchow, via Nanning approximately	660 ,,
From Shasi to Shingyi, with a branch to Changsha from Changteh, approximately	760 ,,
Total ..	3,090 miles

The estimated cost in Mexican currency for the engineering work on the line into Szechuan from Hankow to Chengtu is as follows:—On the section from Hankow to Ichang, $67,000,000:

From Ichang to Kweichow (in Hupeh), $15,000,000;
From Kweichow (in Hupeh) to Chungking, $81,000,000;
From Chungking to Chengtu, $72,000,000.

These figures are approximate only, but they give a total of $235,000,000, and to that amount has yet to be added the financial charges in connection with the raising of the loan, etc., which can be estimated at about a third more, or say, a total of $313,333,333. This would work out at something like £28,000 per mile. A proper study of the country to be traversed may reduce these figures, but they are given because they are the ones which the financers will have to consider in determining the amount of the loan to be raised for the purpose of the railway.*

What is demonstrated by these figures is that the cost of putting a railway into Szechuan, Yunnan or Kweichow will be in the vicinity of at least £20,000 to £28,000 per mile for the mountainous parts, and, as all the routes are beset with heavy masses of mountain, it is likely that the average cost per mile for the whole system will not be less than from £15,000 to £20,0000. Taken at £18,000 per mile it will mean that to build the minimum of 3,090 miles China will have to expend £55,620,000 at least.

The question whether this expenditure is justified is answered by the importance of the territory to be covered; the value of the undeveloped wealth which it undoubtedly contains, and the extent of the population which will be benefitted. In China, railway building differs from similar work in countries such as Canada, America and Australia, where lengthy lines have been run into the vast uninhabited spaces to which settlers have only been induced to go by the fact that a railway has been built. The raison d'etre of railways in the primeval parts which have been opened up in the new countries, is the creation of new settlements, but that does not, to any such extent, actuate those who open communication in China. Here, for centuries, populations have spread to the uttermost ends of the country, and the traveller to any part of the vast regions to-day may find wherever he goes large walled cities, prosperous towns, and continuous cultivation. Populations in China are virtually waiting for railways wherever any length of line might be laid. Out in Szechuan, Yunnan, and Kweichow there is trade. It has been going on for æons. There are big populations in Szechuan in particular, and had the Mahommedan rebellion (1856-1872) not devastated and depopulated Yunnan and Kweichow those provinces would have been peopled like the provinces less seriously affected. Railways are needed in these provinces not only to open up communication, but also to develop the vast mineral and agricultural wealth, the former of which has not yet been touched on scientific lines. They are also required for even a still more important reason and that is to enable the Central Government of China to strengthen its hold upon possible seats of rebellion, and to assist it to defend its frontiers.

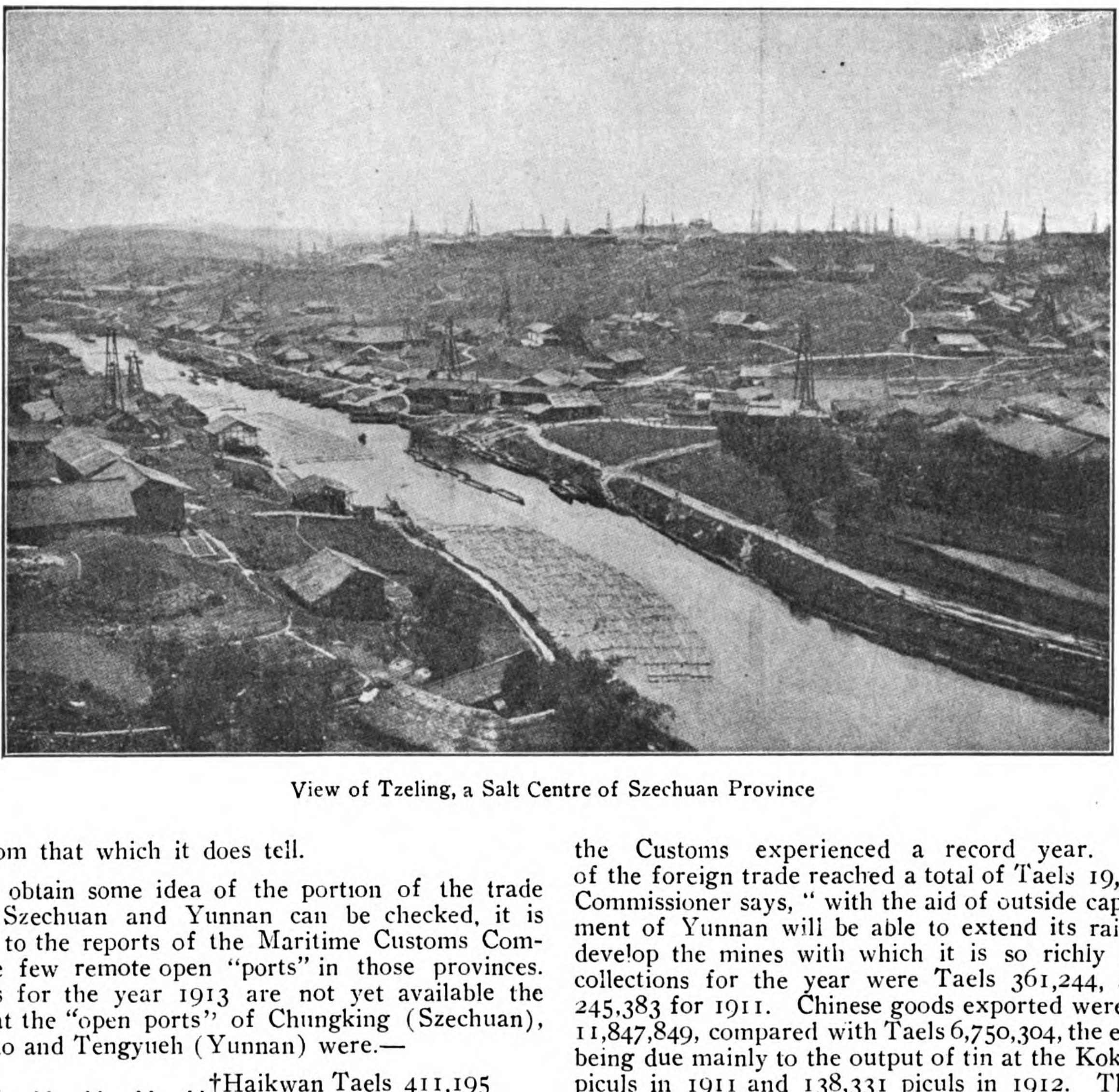
With a progressive Government energetically devoting itself to the betterment of the country by liberal laws for the advancement of commerce and industry, railways to the three provinces should pay, apart from possibilities of large passenger traffic. All three are possessed of great deposits of silver, copper coal and iron, with the addition of gold, salt, zinc, quicksilver, argentiferous lead, etc. Agricultural produce grows in Szechuan, Yunnan, and at least the south sections of Kweichow, in abundance—with no markets other than these near at hand. The people have more than they can consume, and therefore crops are grown mostly for self-sustenance.

Wheat and barley, maize, millet, buckwheat, sesamum, rice and fruit of different kinds such as apples, pears, peaches, walnuts, quinces, and cherries are grown in abundance, and the extremely excellent grazing grounds permit of the breeding of large flocks of sheep, herds of ponies and cattle. Pigs thrive in abundance, the staple meat of the people

* See note at end of this article.

being, in fact, pork. There would be offering for export the valuable mineral products, as well as cereals, hemp, livestock, horns, hides, etc., while the imports would be raw cotton, piece goods, kerosene, cigarettes, and the hundred and one articles of European manufacture which the Chinese have a predilection for. As Colonel Manifold says of the inhabitants of Szechuan, so of the people of Yunnan and Kweichow; they, "like most other Chinese, and unlike most other eastern nations, require no education to make them appreciate articles of foreign manufacture. It is only necessary to develop the natural resources of the province and to give its population facilities for securing a market to ensure that the money is forthcoming. The Szechuanese will then buy everything that he thinks will wear better than the home made article, or which he is unable to make himself, or which will be of advantage in saving labor."

Railways built at such a heavy initial cost could not, of course, become an immediately paying commercial speculation, but they would pay the Central Government in many directions, and with proper handling, under expert traffic officials, combined with a judicious forward industrial policy on the part of the Government, might easily be brought to the paying stage in a very short space of time. Insofar as the French railway from Haiphong to Yunnanfu is concerned it must be understood that it is not being conducted in a manner to inspire confidence and encourage trade*, nor is it operated with the idea of benefitting other trade than French. Were the line from Haiphong controlled with the interests of Yunnan and the railway as the first consideration, and not subordinated to the interests of French trade in particular, it would tell a story different from that which it does tell.



View of Tzeling, a Salt Centre of Szechuan Province

However, to obtain some idea of the portion of the trade which, in both Szechuan and Yunnan can be checked, it is necessary to turn to the reports of the Maritime Customs Commissioners in the few remote open "ports" in those provinces. While the details for the year 1913 are not yet available the total collections at the "open ports" of Chungking (Szechuan), Mengtsze, Szemao and Tengyueh (Yunnan) were.—

Chungking	†Haikwan	Taels	411,195
Mengtsze	,,	,,	365,852
Szemao	,,	,,	6,454
Tengyueh	,,	,,	64,482

In 1912 the Revolution naturally affected trade in the distant parts, and that fact should be remembered when considering the trade of that year in provinces so far removed from the sea as Szechuan, Yunnan, and Kweichow. At Chungking, however, the returns were very little less than in 1913, Taels 404,482 being collected, as against Taels 378,889 in 1911 (also a year of revolution, particularly in Szechuan) an increase of Taels 25,593. The interesting point is that the *export* tables show that the increase of exports for 1912, as compared with 1911, amounted to Taels 48,051 and Taels 31,664 as compared with 1910. The net value of *foreign goods* imported, direct and coastwise, was Taels 7,815,401, a decrease of Taels 4,743,999 on the corresponding figures of 1911. The Commissioner of Customs at Chungking particularly refers to the manner in which foreign trade was benefitting local people by citing a rise of 15 to 20% in a new article of export for the foreign market, an increase which went mainly into the pockets of the producers; this despite the absence of all but most perilous communication. What these perils are is also indicated by the Commissioner when he says that during 1912 inward bound junks to the number of 240 were either wrecked or stranded at the rapids. No mention is made of the disasters to junks bound down-stream. The total value of imports and exports was Taels 26,872,475 as against Taels 32,308,635 in 1909, showing the effect of the revolution of 1911-12.

The Ichang Commissioner reported that in 1912 the export of hides, skins, and wheat had more than trebled, vegetable tallow rose from 12,041 piculs in 1900 to 30,047 piculs; varnish was almost doubled; nutgalls increased fully four times; leaf tobacco rose 150 per cent, while coal also rose 150 per cent.

In Yunnan trade was also affected by the revolution, yet at Mengtsze the Customs experienced a record year. The net value of the foreign trade reached a total of Taels 19,569,689, and the Commissioner says, " with the aid of outside capital the Government of Yunnan will be able to extend its railway system and develop the mines with which it is so richly endowed." The collections for the year were Taels 361,244, as against Taels 245,383 for 1911. Chinese goods exported were valued at Taels 11,847,849, compared with Taels 6,750,304, the enormous increase being due mainly to the output of tin at the Kokiu mines—95,624 piculs in 1911 and 138,331 piculs in 1912. The Commissioner adds that " the washing and smelting plants imported in 1910 and 1911 by the Kokiu Tin Mining Company are at last in working order and were completed during the year by the installation of an electric plant, and an important increase in the output of tin and an improvement in its quality are therefore keenly anticipated in the future. The exploitation of a new tin mine is being started at the foot of the Kokiu mountains, in the Mengtsze plain, by another company. Zinc (spelter) rose from 2,732 piculs in 1911 to 12,494 piculs but *the great distance of the producing centres*, Tungchwanfu, *in north Yunnan*, and Hweilichow, *in south Szechuan, on the left bank of the Yangtsze*—both far from actual railhead (Yunnanfu)—precludes the idea of a much-

*Attention is drawn to an article which appeared in the FAR EASTERN REVIEW of September, 1912, entitled "Closing the Door in Yunnan," which sets out the manner in which trade other than French is discriminated against.

†The Haikwan (or Customs) Tael equalled during 1912 3s. 0¾d. in English money; 74 cents U.S. Currency; 3.85 Marks; 1.49 Yen; and 152. Mexican Currency.

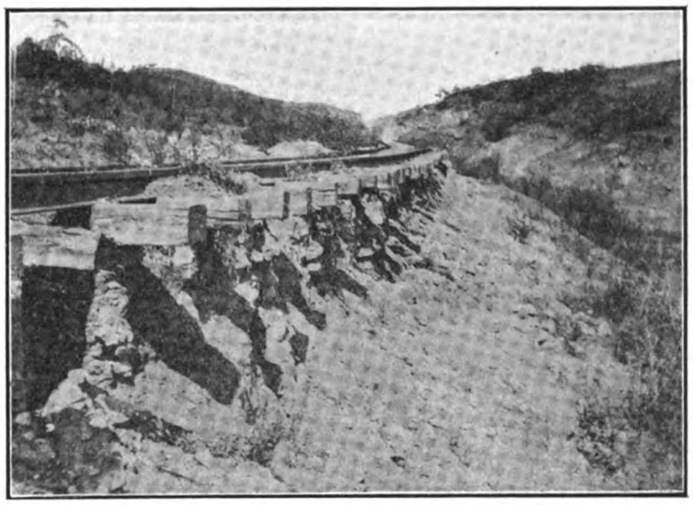
developed exportation for the present." This particular fact of long distance porterage to reach the railway is noteworthy. "In August the Railway Company (French) raised its freight on tin for Haiphong from $40 to $45 per ton of 1,000 kilos, a measure which was felt very much by the merchants *and will hasten the construction of the Yunnan-Kwangsi railway*." The italics are ours. This reference to the mineral development bears out the arguments advanced as to the necessity of railways to these distant provinces, and the mention of the increase in freights on the French line substantiates what is said in another part of this article in reference to the freight rates on the Yunnan-Haiphong line.

At the remote port of Szemao in southern Yunnan the volume of trade reached Taels 262,801, the value of foreign goods imported being Taels 219,578, which was carried by 5,187 men and 19,698 pack animals.

At Tengyueh, another remote port in the far south-west, served only by carriers or pack trains, the foreign goods imported reached Taels 1,842,000, nearly 78% of which were sent inland under transit pass. Chinese goods to the value of $682,000 were exported, 70% being Szechuan silk.

These references to Customs statistics are made merely to show what trade is carried on, despite the tremendous difficulties of transport and the great distances from the sea, and are only from those places where the Maritime Customs have stations. Trade passing through other routes is not recorded, and there are no means of accurately ascertaining what it is, but the Customs reports are sufficient to show that railway communication would not only create a tremendous change in the economic state of the provinces concerned but would also benefit foreign trade immeasurably.

Having touched upon aspects of the question indicating the reasons why railways have not yet penetrated the mountain ringed provinces, and the reasons why communication by rail should be opened up, we will give some description of the various routes by which the Chinese Government are now prepared to undertake the construction of lines into Szechuan, Yunnan, and Kweichow. In this connection, too, we wish to draw attention to an article appearing on another page, in which, under the title of "The Railway Development of Western China," Mr. Arthur J. Moore-Bennett discusses the question. Mr. Moore-Bennett brings to his task a personal knowledge of the routes he refers to and is competent to criticise them. We content ourselves with dealing with the broad features for the general information of readers.


Portion of the Szechuan Railway from Ichang built by the Chinese

The routes by which the Chinese Government have made agreement to enter the western provinces are as follow:—

First, the Government has agreed to the extension of the Hankow-Szechuan railway, now being constructed from the Hukuang Railway Loan funds, from Kweichowfu to Chungking and Chengtu, the Capital of Szechuan.

Second, on December 18, 1913, the Government signed a preliminary agreement with Lord ffrench, representing Messrs. Pauling and Company, of London, to construct a line on a percentage basis contract from a point opposite Shasi, on the Yangtsze River, west of Hankow, to the south-west of Kweichow province, to join the projected line from Yunnanfu to the sea via Shingyi and Nanning.

Third, on February 11, 1914, the Government signed an agreement with the Banque Industrielle de Chine, a Sino-French institution, for a loan to build a railway from Yamchow on the coast, west of Pakhoi, to Nanning, and Shingyi, to Yunnanfu, the capital of Yunnan province, and on to the Yangtsze river at Suifu, and thence to Chungking, where it will connect with the line mentioned in the first paragraph.

Fourth, on August 4, 1913, the Government signed an agreement with Belgian representatives for the flotation of a loan to build a railway from Tatung, in the north of Shansi, through Taiyuanfu, to Tungkwan, the junction with the railway in course of construction from Lanchow to the sea, and accorded in that agreement the right to extend the line southwards to Chengtu the capital of Szechuan.

The fourth line is so far but a right of extension. It is not yet decided to build it, but the first three are to be built, and no doubt financiers will soon be active raising the necessary capital for the purpose. They will, when built, be sufficient to give the three provinces adequate railway communication with the other provinces of China and the outside world for many years to come. The following is merely information on, and not criticism of, the routes those lines will probably take.

From Hankow to Szechuan

It has been, of course the particular desire of politicians financiers, engineers, and traders, interested in railways in China to construct a line which would, among other things, reduce the journey into the heart of Szechuan province from a strenuous and dangerous ordeal by way of the Yangtsze River to one of comparative safety, comfort and speed by rail. The conflict between, and the subsequent adjustment of, British and French schemes having in view the object of building this railway were fully discussed in the January issue of the FAR EASTERN REVIEW, and it is not necessary again to deal with that aspect of the question. Suffice it to say that as a result of discussion of the particular interests of the British, Americans, Germans and French the financial representatives of those countries formed a Group to finance and construct what is known as the Hukuang railways, the term Hukuang being derived by the union of the two first characters of the provinces of *Hu*-peh, *Hu*-nan, and *Kuang*-tung, through which the lines to be built by the Group will run. This system comprises

(1) a line running south from Wuchang, opposite Hankow, to the southern border of Hunan, where it will connect with what is known as the Yuet-han railway—the Chinese line running from Canton northwards to the Hunan border—which is destined to form part of the trunk railway from Hankow; and

(2) a line westwards to Szechuan from Hankow, or the best available point in the vicinity.

In the original negotiations with the Chinese Government the arrangement was come to that Chinese capital should build whatever lines were needed in Szechuan province, the Quadruple Group terminating their system at Kweichow, just over the frontier of Szechuan, the proviso being clearly made, however, that if it was ultimately decided by the Chinese to use foreign capital the necessary amount would be accepted from the Group.

Content with this arrangement the members of the Group decided among themselves the division of engineering influence on the lines to be financed by them, setting aside the section from Wuchang to the Kwangtung border for the British, the section from Hankow, or vicinity, to Ichang for the Germans, and the section from Ichang to the Szechuan frontier for the Americans, the French standing out of this allotment in anticipation of obtaining their share in the ultimate extension to the capital of Szechuan, which, with considerable foresight, they located as the "sphere" most essential for the development of their plans for the domination of Szechuan and Yunnan provinces. To the various parties constituting the Group it was a foregone conclusion that the Chinese would never be able successfully to build a line through Szechuan, and their confidence in the belief that the Chinese would ultimately have to approach them for the capital if they wished to penetrate

Szechuan with a railway was not misplaced and has been justified by time. Having thus come to a satisfactory mutual arrangement among themselves they negotiated an agreement with the Chinese Government for a loan to construct the Hukuang railways, the document being signed on May 20, 1911. This authorised the Banks to issue a five per cent. gold loan for an amount of £6,000,000 to be devoted

(1) to the redemption of bonds to the value of Gold $2,222,000 issued by the American China Development Company on behalf of the Imperial Chinese Government, and

(2) the construction of a Government railway main line from Wuchang to the southern boundary of Hunan, connecting with the Kwangtung section, an estimated distance of 900 kilometres, and

(3) a similar line from a point at or near Kwangshui, connecting with the Hankow railway line and passing through Siangyang and Chingmenchow to Ichang, an estimated distance of 600 kilometres; and from Ichang to Kweichowfu, in the province of Szechuan, an estimated distance of 600 kilometres, the total length of this, "the Hupeh section of the Szechuan-Hankow railway line,"—and the one in which we are particularly interested in this article—being 900 kilometres.

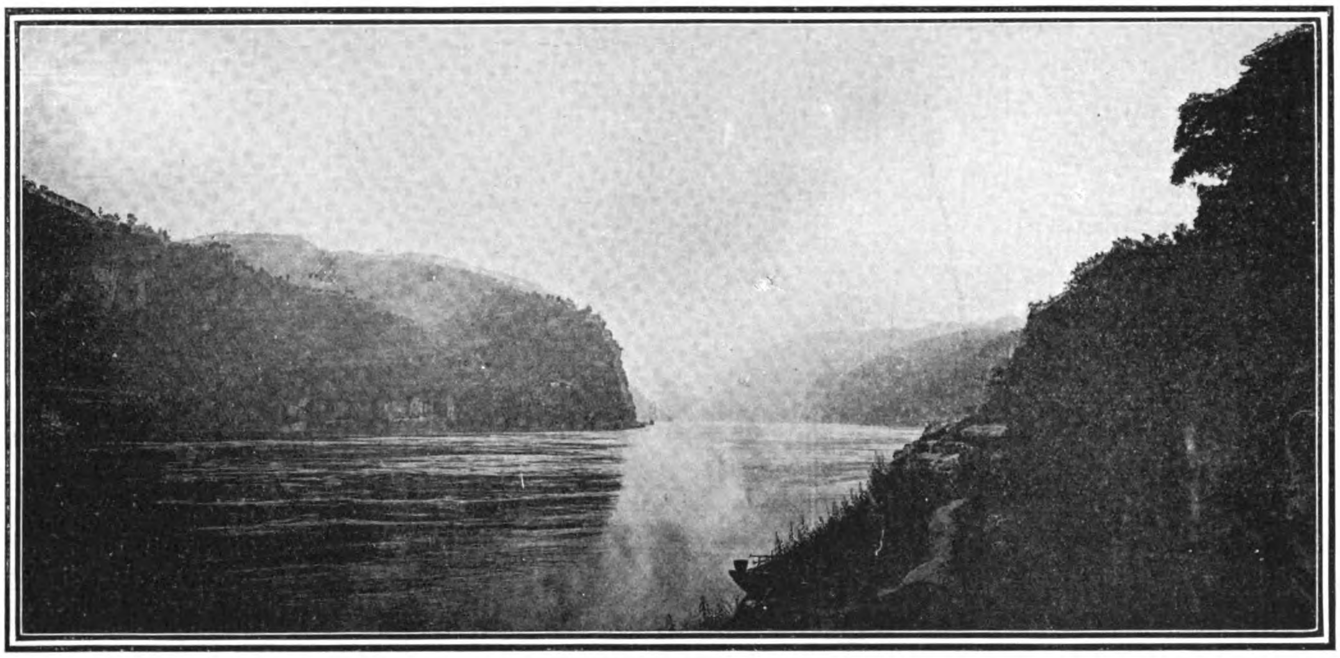
Three days after the loan agreement was signed the representatives of the Banks concerned met in Paris and arranged, among other things, for the participation of the various parties in the event of the extension.

By this arrangement the French now control the section from the Capital of Szechuan to the end of their allotted distance, for, as mentioned in our last issue, the Chinese Government have now agreed to the extension of the line through Chungking to Chengtu, and the Groups are making arrangements to have the necessary finances raised. In all, the distance from Hankow to Chengtu via Chungking will be somewhere in the vicinity of 1,100 miles, the whole Hukuang system amounting to about 1,700 miles, and that, in short, is to be divided as equally as possible between the four nations composing the Group, both as regards engineers, purchasing commission and profits from flotation of the loans.

Before the Chinese Government had come to an agreement with the Quadruple Group to finance the line from Hankow to the eastern edge of Szechuan, Chinese merchants had made an attempt to connect Ichang and Chengtu, a semi-official company having been formed for the purpose by Viceroy Hsi Liang, in 1904; to prevent a foreign loan being negotiated. A sum of Tls.15,405,902 (about £2,000,000) had been collected in shares and taxation, but only about 28 per cent. had been subscribed voluntarily, the balance having been obtained by forced levy of a tax upon land holders. A meeting of the Company—the Szechuan Railway Company—was held in November, 1909, when it was confessed that although the first sod had not been turned only Tls. 10,421,958 (about £1,357,000) remained in hand, the staff of the company on the books being 209, drawing some £8,500 per year in salaries and wages. This meeting, however, gave a fillip to the enterprise, and the first sod was turned on December 10, 1909, at Ichang, though a controversy had waxed furiously on the question of whether the section between Ichang and Wanhsien or between Chungking and Chengtu should be commenced first. The Ichang supporters won the day; the first spike was driven at Ichang on July 21, 1910, and by October, 1911, when the revolution broke out, 16 miles of line had been built, while, preliminary work had been begun over sixty miles.

The work actually completed or in hand might be summarised thus: The bunding of the wharf was finished, three goods godowns were erected, earth work at the wharf and station were finished, a double track was laid from the wharf to the station, the Ichang station and four stations along the line were finished, two engine sheds for twelve locomotives, a water tower, and machine shop were finished, the head administration office, store department and staff quarters were finished, stone retaining walls and over fifty bridges were finished, two tunnels were completed, while over sixty bridges, and several tunnels were started. Altogether 15,000 coolies were at work, and construction was going ahead when the effort of the then Minister of Communications to bring about the nationalisation* of railways ended in the turmoil which precipitated the revolution.

Work ceased completely, and the rolling stock of three Baldwin shunting engines, one first class private car, two second class passenger cars, four third class passenger cars, fifty high side freight cars, thirty steel ballast cars, and twenty flat cars stood over as a legacy for those who would ultimately take up the work, and the line which had been built rapidly began to deteriorate. An eventual examination into the affairs of the company disclosed many scandals, among the worst being the disastrous employment of funds to purchase shares in wild-cat rubber companies. This was the inglorious end of the attempt of the Chinese to build and control their own railways in Szechuan, and it was the death knell of the old policy of preserving the province from the encroachment of foreign finance and politics through the medium of railways. The Government would not permit, even if a wish for it had been expressed, any further private control of what must eventually be an important trunk line, and although there was great reluctance to do so the



The Yangtsze at Ichang

*See Revolution Number of the FAR EASTERN REVIEW, April, 1912.

NEW RAILWAYS IN WESTERN CHINA

The black line running from Chinchow or Yamchow, on the coast through Nanning to Kutsingfu, and from Yunnan to Chungking shows the approximate route of the railway granted to the Banque Industrielle de Chine to capitalise by a loan. The Hukuang system now in course of construction is distinctly shown. The British section is from Yichang, near Chenchow, on the Kwangtung border to Wuchang; the German section is from the Peking-Hankow railway to Ichang; the American section is from Ichang to Kweichow, and the French section is from Kweichow to Chengtu. The Yuet-han Railway Company is building the southern section between Canton and the frontier at Yichang, but there is an effort being made to secure the rights of the company for the Hukuang Loan Group, or in other words to have the section nationalised and redeemed with a loan by the Group.

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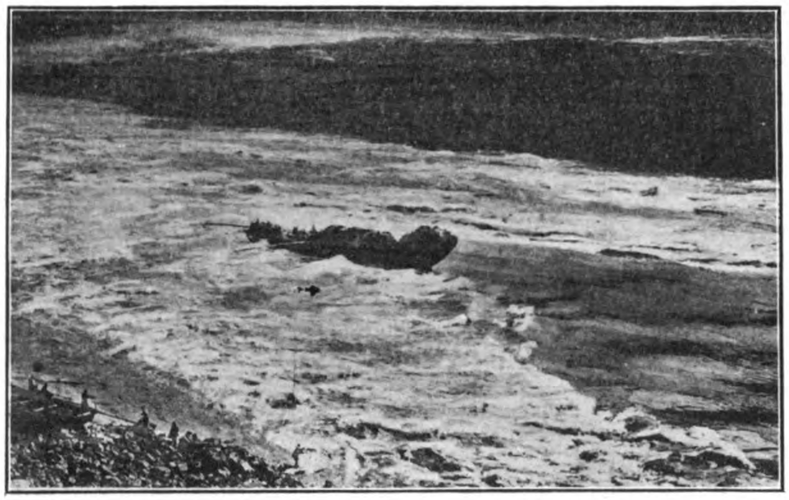


A 50 ton cargo junk descending the Glorious Dragon Rapid, Upper Yangtsze

Government in January, 1914, finally agreed to the extension of the line to Chengtu by the Quadruple Group.

It was not until January, 1913, that the Quadruple Group felt disposed to advance money to commence operations on the lines for which they had floated the loan. After the revolution the original security of the loan was found to have been rendered inadequate and a readjustment had to be made. The Government, too, had considerable difficulty in arriving at a satisfactory arrangement with the companies holding the rights over the Ichang section of the Szechuan railway and the Chinese private line between Changsha and Chuchow, which it was essential to redeem, as both were on the routes of the proposed trunk lines. Eventually, however, resumption was satisfactorily accomplished and survey work on the American section of the line to Szechuan, which embraced the unfinished line from Ichang, was the first to be commenced.

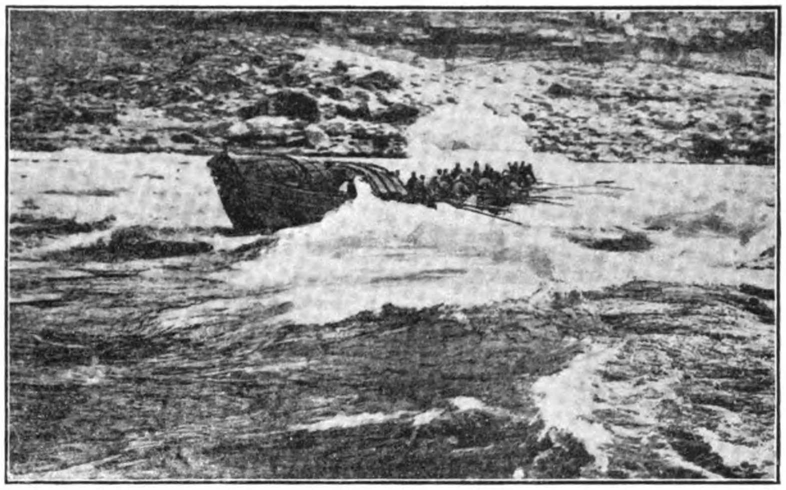
Thus was order created out of chaos, and thus was the work commenced upon what is destined to be one of the most important railways in China, a means of communication which will eventually give Chengtu connection with the sea over what will total approximately 1,700 miles of rails. The sea end of that line commences at Shanghai, and the traveller will journey via Pukow, Sinyang, and Hankow to his far distant destination. All the lines to make the connection are now under construction, or under survey, and what was once a dream is rapidly verging upon the reality.

The consummation is, however, beset with great difficulties. To connect the Pukow station, now in touch with Shanghai by rail, with the Peking-Hankow railway above Hankow is easy; to push to the west of Hankow is a heavy task. When the agreement was made it was the wish of the Chinese to start from the Peking-Hankow railway at Kwangshui and touch at Siangyangfu, then striking south to Ichang, but the great increase of haulage makes that route undesirable for a trunk line. As the low-lying nature of the country between Hankow and Ichang renders railway building almost impossible the engineers have surveyed other routes, and it is now recommended that the line shall branch off from the Peking-Hankow some eighty kilometres to the north—about Siaokan—and then take almost a direct line, taking advantage of the higher ground that is available along this route. There is a likelihood that the selected line will pass Yingchen, and go straight across to Tangyang and then to Ichang, but the trade route from Siaokan goes northwestwards to Anlu and then goes south-westwards to Kingmen, Tangyang and Ichang. However, the problem for the engineers is to select the the route which it is safest to build and straightest, and they are now engaged endeavoring to find a solution. The Engineer-in-chief of the German section recommends that a complete survey be made before deciding to build owing ot the high cost. He wishes to have the Siangyangpu branch built. Ichang, is 1,000 miles from Shanghai by river. It is important only by virtue of its position below the gorges of the Yangtsze, and figures mostly as a centre for the transhipment of cargo. All merchandise upward bound to Szechuan and Yunnan is transhipped from the steamers here and mostly placed on junks of from 25 to 40 tons burden, which are tracked laboriously through the gorges by gangs of coolies, often numbering 100 to a junk, and taking as long as three months in bad states of the river to cover the 400 miles to Chungking, while at some periods navigation is not possible at all. In addition to the junks, however, steamers have now been built to stem the rapids and despite the tremendous dangers manage to maintain a more or less regular service. At present one new boat is in course of construction for this purpose, and one is in operation, the " Shutung," commanded by Captain Plant, the pioneer navigator of the Upper Yangtsze. It is estimated that 10 per cent. of the junks which traffic through the gorges are lost, and with them go down whatever cargo they are carrying. The railway, when it is built, is bound to secure the whole of the trade now compelled to pass up and down through the gorges, and that was the prime inducement which influenced the Chinese to commence construction from Ichang.

While much earthwork, bridging and tunnelling was done by the Szechuan Railway Company the American engineers now surveying in the region believe that by going about 10 miles inland from the river they will be able to secure a route much shorter and of easier grade. The Chinese line followed the river to a greater or less extent and between Ichang and Wanhsien, about 140 miles, fifteen miles of tunnels, to say nothing of the heavy cutting and bridging, would have been necessary. Beyond the town of Hsiangchi there is a succession of precipitous mountains and lofty passes, the lowest of which is 800 feet and the highest 4,000 feet, and thence to Wanhsien the mountains stretch down to the Yangtsze like the teeth of a comb, the cost estimated by the Chinese to overcome these difficulties being Taels 38,500 a li (about one-third of a mile). The tunnels found to be necessary not far from Ichang were bored, while work was started on two some fifty miles out, one being 6,200 feet long and another 1,000 feet long. Altogether two tunnels were completed and eight others were started, 1,500 feet of the long tunnel having been driven when work ceased.

The river as far as Wanhsien skirts between the edge of mountainous country, split in every direction by gorges and chasms, vertical cliffs of coarse conglomerate towering a thousand feet above the water. The eighty miles between Ichang and Kweichow is, of course, the great gorge region, the rapids commencing 15 miles above Ichang. The hills generally lay north and south right across the route of a railway. Above Wushan, just over the Szechuan border, the mountains recede a little, but at the Windbox gorge, the furthest upstream, and perhaps the most picturesque, the cliffs are not inferior to those below, but the hills again recede and the river opens out into a broad reach at Kweichow. The mountains then run in a north-easterly and south-westerly direction being of peculiar formation and broken by cross ranges, with coal and iron seams visible in many places.

Salt Junks at Tsungyang Custom House, Kweichow, Szechuan



A cargo junk descending the Tchin Tan Rapid, Upper Yangtsze

Mr. Randolph, the acting Engineer-in-chief for the American section, endeavored to discover a route calculated to escape the difficulties presented on the Chinese location and eventually succeeded in doing so, finding at the same time a much shorter line, though the work to be done on his route will still be heavy. Between Ichang and Nantu there will be about 22,000 feet of tunnelling to say nothing of the bridging and the almost continuous cutting, and between Nantu and Kweichow in Hupeh the tunnelling will amount to between 12,000 and 15,000 feet, while the bridging will be much less than on the preceding section. The survey of the first section was to have been concluded in January, and if the report is favorable the route upon which the Chinese engineers worked will be abandoned.

Probably the Ichang-Kweichow section of this line is more difficult than what succeeds, but the two hundred and more miles to Chungking will give the engineers ample scope for displays of talent and ingenuity in overcoming the problems which nature has managed to set in her effort to isolate this rich province from the outer world. The existing road between Kweichow in Hupeh province to Kweichowfu in Szechuan, follows the river to Patunghsien, and then branches north-west over passes reaching 5,500 feet at Tachang, 3,300 at Taninghsien, till it is about 30 miles from the Yangtsze and then turning at right angles goes almost due south to Yun-Yanghsien (1,000 feet), at the junction of the Wantungho, an affluent, with the Yangtsze. It then follows the river for about 30 miles to Wanhsien (600 feet), and leaves the river, which comes from a south-westerly direction, going nearly due west at an elevation from 1,000 to 3,400 feet to Liangshanhsien (1,650 feet.) The road, which runs through innumerable villages and some cities, keeps about 40 miles from the river, the elevation dropping between Liangshanhsien and Tienkianghsien (1,350 feet.) For thirty miles it goes due west to Linshuihsien (1,170 feet), and drops due south to Kiangpeiting—on the opposite bank of the river from Chungking. The elevation from Linshuihsien to Chungking is about the same 1,170 to 1,600 feet, and sloping near the river to 750 feet. Chungking is the first objective of the line, for it is the largest commercial city in the province and is the port where all the commerce concentrates. All the trade from the Chengtu plain and from along the Yangtsze and its feeders to the south-west come to Chungking. The city is splendidly situated, on a spit of land at the junction of the Kialing-ho with the Yangtsze, for waterborne traffic, but the Kialing river makes a bridge of some importance necessary to bring the railway to its portals. As the line from Yunnan is to come from the west the river has to be bridged, so Chungking gains by that especially as there is a possibility of a line to Chengtu being continued on from Linshuihsien, 60 miles before Chungking is reached.

The construction of a railway along the 299 miles between Chungking and Chengtu, though the country is more or less mountainous until the Chengtu plain is reached, offers no extremely grave difficulties. Soon after leaving Chungking a region is entered which is well supplied with waterways and canals which may affect freight possibilities. The main road between the two cities is described as one of the best in China, being paved with stone slabs, and is a constant avenue of traffic. In what is called the Red Basin is one of the richest regions in the whole world, and perhaps the most densely populated, for its 70,000 or 80,000 square miles carry 50,000,000 people intelligent, industrious, thrifty and commercially progressive, any railway between any two cities should pay. Every valley is under intense agriculture, hillsides are terraced and cultivated to the summits; throughout the length and breadth of it—an area almost that of Belgium—there is not a road which would carry an ordinary wheeled carriage or wagon; the wheelbarrow is the only wheeled vehicle used, and as Colonel Manifold says, "in these days of severe industrial competition it seems almost incredible that a country with this enormous population and natural advantages should be allowed to remain without a railway when even the local traffic from town to town would have been sufficient to make one pay."

The system of irrigation on this plain, which enables it to support its 50,000,000, is remarkable, and earned for Li Ping, the Chinese engineer who created it, the rank of "first gentleman," and secured for him the erection of commemorative temples throughout the length and breadth of the land. Crops grow one after the other with amazing rapidity, says Mr. R. Logan Jack, and, as many as seven successive harvests can be

A Rope Suspension Bridge, near Kweichowfu, Szechuan.

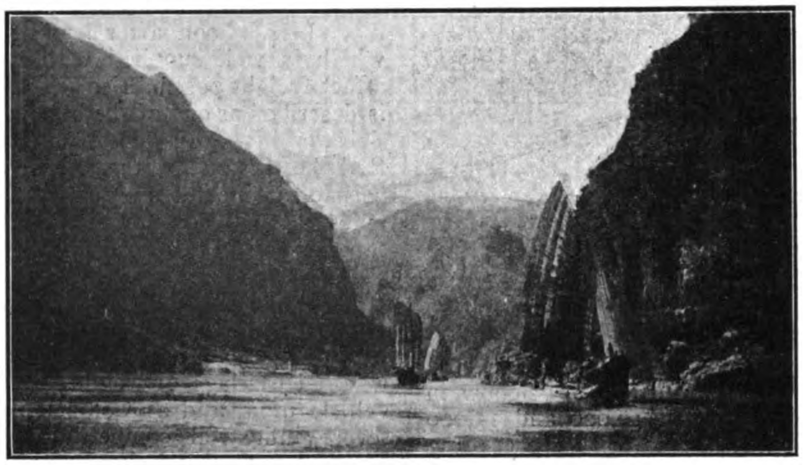
made in the course of a year. All manner of fruits and cereals grow in abundance, and the fields which were once blooming with poppy for opium production now are covered with waving wheat. Peaches, apricots, plums, oranges, lemons, pears, apples, mulberries, persimmons, cabbages, lettuces, kale, turnips, endives, carrots, cucumbers, melons, peas, beans, pumpkins, millet, barley, rape, maize, oats, buckwheat, wheat, and sugar-cane are among the products. Water for irrigation is lifted from the natural and artificial streams by chain-pumps or huge bamboo waterwheels, and bridges of quaint and picturesque appearance abound on all sides, the natives appearing to have "anticipated most of the finest conceptions of modern engineering;" bridges are camel backed, hog backed, level decked, and arched in all sorts of styles, and made of wood and stone. Industrially the natives are strenuous laborers, mining coal, copper, zinc and other ores with primitive methods. The chief industry is that connected with the preparation of salt*; great brine, deposits are situated about the centre of the Red Basin, but in the east and other parts of the province wells are also worked. At Tzu-liu-ching natural gas is used for boiling the brine, while coal is the fuel in other places. The wells from which the natural gas emanates have never been worked for petroleum, but, in the words of Sir Alexander Hosie, "the stench which permeates the whole town reminds one forcibly of a gasworks." In the future these wells may yet be of great account in the world's oil supply.

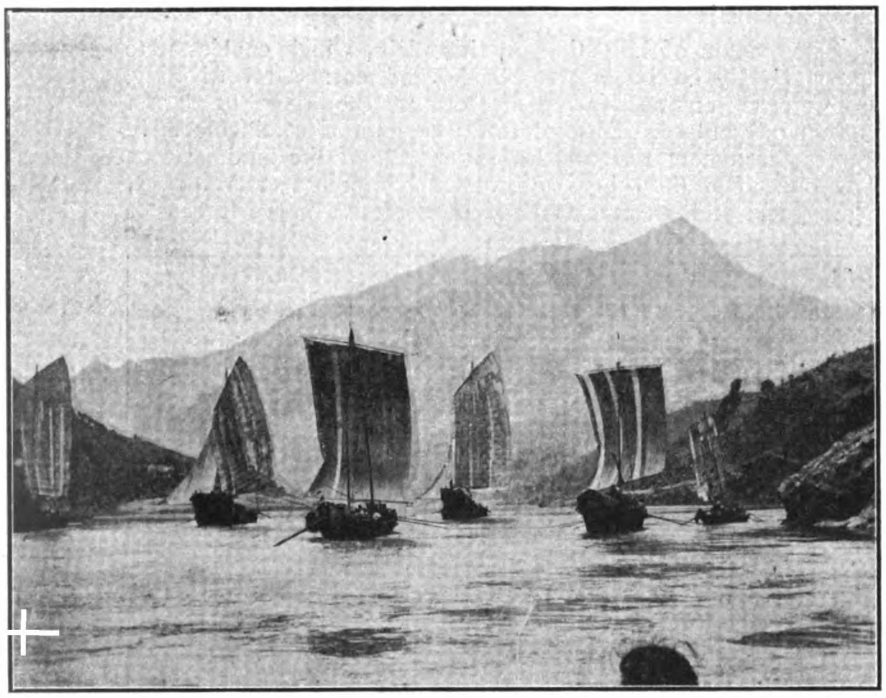
The plain immediately about Chengtu, some 70 miles in length by 30 in width, is naturally of great wealth and prosperity, and contains many populous cities, the great highway leading to the capital from Pengshanhsien, on the Min river, being, for a distance of forty miles, "like one long street lined with houses."

Chengtu itself is a splendid city, encircled by walls 30 to 40 feet high, and about 12 miles in circumference with a population set down by Richtofen at 800,000, while the Chinese claim 1,000,000. The streets are broad, paved, and lined with rich shops, stocked with silks, furs, silver ware, etc. A big commerce is done in the city, which can be reached by large boats from the Min river during six months of the year, and smaller ones during the remaining months. Once a railway reaches Chengtu it will not be long before lines are run out to the surrounding regions to tap the large and important producing centres that exist on all sides.

If the road direct from Chungking is taken to Chengtu for the railway there is a choice of two routes fifteen miles from Chungking, the shortest one going direct to the capital through Pishanhsien (1,150 feet) Tatsu-hsien (2,500 feet), Anyohsien (1,170 feet), Lochihsien (1,640 feet) and Kienchownan (1,330 feet).

Colonel Manifold in reporting on the result of his investigations with the object of establishing railway communication states that "unless this planet were to stand still this naturally rich province must advance with the rest of the world. But Szechuan must first be opened up from the east and the increased prosperity which rapid and safe means of communication will bring to this province will cause new outlets to be sought and these will be in the direction of Yunnan. The importance of this line from the lower Yangtsze rests not only upon its being a sound undertaking financially, but also on the fact that it will become the centre from which will radiate the great system of railways stretching from the Indian Ocean to the North China seas."





Typical views on the Yangtsze

Photos by Capt. T. C. Fitzhugh, M. V. O.

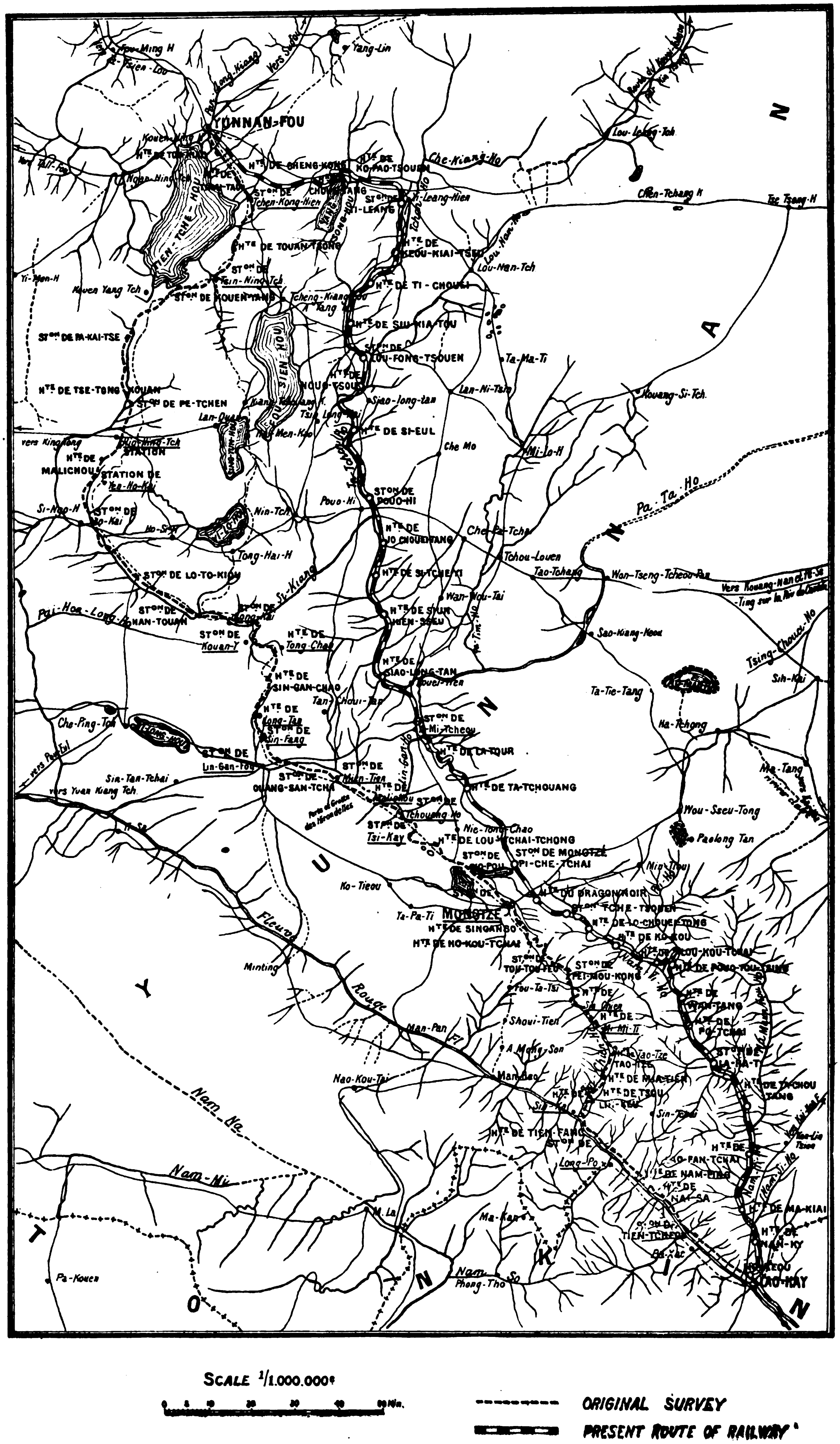
From Lamchow, on the South Coast, to Yunnanfu

The most important railway which is projected for construction into Yunnan is the one for which the rights have been given to the new Banque Industrielle de Chine. It is to run from the little known port of Yamchow, west of Pakhoi, to Nanning, then through the Yu-kiang valley to Yunnanfu, and onwards into

*In the Far Eastern Review of December 1912 a full description of China's salt deposits and a history of the Salt Gabelle was given, including Sir Alexander Hosie's reports on the Szechuan wells.

Szechuan, Chungking being the terminus, an approximate distance of 1,200 miles.

The route up the valley of the West River has always been the natural one into Yunnan for all south-China trade, and many different officials and merchants have from time to time urged the building of a railway at least from the head of navigation at Poseh across the mountains to the Capital of Yunnan. In 1899 a Chinese named Tangkiao worked up an agitation with this object in view, his arguments for a railway being stressed by the building of the French line from Tonkin to Yunnanfu. Tangkiao, in a petition to the Viceroy, set forth the claims of the his proposed line, both from a strategical and commercial point of view, so strongly that he was able to stir up action. He insisted that the line was a necessity since the French railway was pushing north from Tonkin, and the British were talking of a railway from Burma. "What we need," he wrote, "is a line which will be of commercial use and enable us to defeat the French." A line from Yunnan to Poseh and on to Nanning, in particular, would enable the Chinese, he said, to secure the traffic from Yunnan; would develop the rich mineral resources; would expand and cement close relations with China's most commercial province, Kwangtung, and would, in the event of a war with France, permit of the rapid movement of troops to Yunnan, Kwangsi and Kweichow. As a result of this agitation the Ministry of Communications in 1911 sent Mr. K. S. Low, one of their best engineers, to survey the line from Poseh to Yunnan, and to communicate his report to the Viceroy. His instructions were to avoid branching from the French railway, and the line he located to comply with that order is described later. The revolution prevented anything



FRENCH RAILWAY INTO YUNNAN FROM TONKIN

tangible springing from the scheme so far as the Chinese gentry and merchants were concerned. They could not raise the funds; so the matter was, in May, 1912, again brought to the attention of President Yuan Shih-kai, who replied to the Yunnan Tutuh that he had not overlooked the importance of the project and that he had instructed the Ministry of Communications to study the question and furnish him with a report. The Tutuh of Kwangtung also brought the matter up, and, later, the Ministry of Communications despatched two Chinese engineers to make a report to supplement that of Mr. K. S. Low, the President notifying the Yunnan Tutuh that as soon as these engineers made their report he would publish the regulations for a Chinese Company to carry out the work. The President also urged the Tutuh to see that the Tutuhs of Kwangtung, Kwangsi, and Kweichow, in conjunction with Yunnan, could have the necessary capital raised, adding that the Central Government would supervise the enterprise. The two engineers were despatched in due course, and arrived at Yunnanfu in the summer, where they worked with Mr. W. S. Dawley, who had been engaged by and was surveying for the Yunnan Railway Company, which had subsequently dissolved. The Tutuh displayed a keen interest in the work, and the Yunnan Railway Bureau was organised. The appointment of Dr. Sun Yat-sen to undertake the construction of future railways rather embarrassed the Bureau, but in 1912 it advised the Tutuh to proceed with the building of the line, a matter which was later on referred to Dr. Sun. The Tutuh replied to the Bureau on the strength of advice that the line to the Kokiu tin mines from Mengtsze should first be built, but the Bureau responded that, if it were desired to build but a short section of railway, a line should be run from Yunnanfu to Yanglin, which would later serve as the base of a line to Poseh and one to the Yangtsze, the proceeds from the former being probably sufficient eventually to enable the Yunnan-Szechuan line to be built by the Chinese. The small line to the tin mines would, the Bureau argued, be but a feeder to the French railway, and that they did not desire to construct since the building of that line would be working for the benefit of French interests.

Mr. K. S. Low (Low Kuo-sui)

For the reason that sufficient capital could not be raised this scheme fell through, and the next heard was that the Tutuh of Yunnan was negotiating with a German firm to have the line built. The French at once became active, for they had certain claims, and the German hopes—if there ever were any—were blighted, for the French Minister in Peking rightly became alert in support of his nationals and managed to have two birds killed with one stone. He secured the line from Yamchow to Yunnanfu and from Yunnanfu to Chungking.

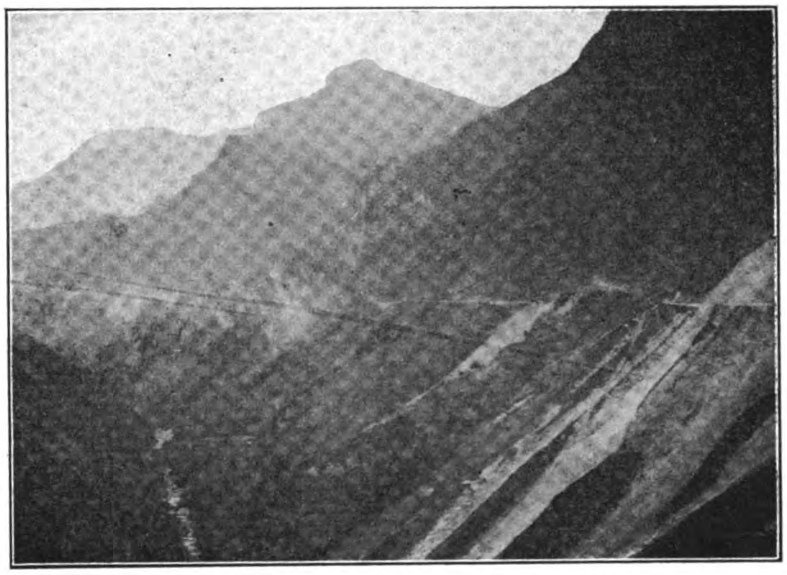
Most talk of the former proposal has centered round a termination at Pakhoi, and it came as a surprise to the public when it was announced that Yamchow had been selected. But there were good reasons. Yamchow has a natural harbor, said to be deep enough to float sea-going vessels, and has the additional advantage of being sheltered by hills from the typhoons which occasionally sweep over this region. It will have to receive some attention to make it fit for a port, but that is said to be an easy matter. The northern pronunciation of the name of this town is Chin-chow, and on some maps that rendering is given instead of the southern one of Yamchow. In the Ching dynasty the military Taotai of the territory resided there; and the locality used to be famous for the four hills of Anking, Chutze, Chungjen and Shihwan which are near by. Two rivers debouch in the harbor, flowing past two sides of the city, and they bring down a certain amount of trade, articles exported being sugar, indigo, tobacco, rice, medicines, pearl-shell, coral, silver, gold, and coal. The mountains offer no distinct difficulties to railway construction, and the route of the projected railway will probably follow the trading road to Nanning, which city is entered over plain lands, the valleys en route, being cultivated.

Since Nanning superseded Kweilin as the Capital city of Kwangsi province it has increased in importance. Its situation on the West River (or Sikiang) just below where it branches to the south-west towards Lunchow in Tonkin, and north-west to Yunnan, is advantageous to it as a distributing centre. It is on the north side of the river, and if a route is located for the railway on the southern bank there is a likelihood that it might be found expedient not to connect directly with the city since the river is wide at the place and bridging might not be worth the while. Nanning is a walled city and was declared open to foreign trade in January, 1907. Its growing importance can be gauged from the fact that in 1912 the total value of the trade passing through the Customs Office was Hk. Tls. 7,033,825, an increase of about 30 per cent. above the highest figure on record. Exports as well as imports showed enhanced progress. The principal exports were beans, canes, dried lizards, medicines, brown and white sugar, ground-nut cake, paper and aniseed. The bulk of the carrying trade is now done by motor boats. The journey from Wuchow to Nanning by boat occupies about twenty days, but the motor boats make the round trip between Wuchow and Nanning in six days.

The character of the country on the West River alters about Nanning, the hills giving way to plain close by the city, but cultivation is not generally so heavy as the river is ascended as might be supposed. In this regard, Mr. Archibald R. Colquhoun, writing in 1883, says "To arm-chair projectors, who, studying some imperfect map of China at home, may fancy that alongside this waterway of the West River there must exist a teeming population living on enormous cultivated plains on its banks, it is the duty of the truth seeking and truth-telling traveller to dispel the illusion. The province of Kwangsi, compared with other provinces of China, is mountainous, bare, and barren, thinly peopled and with only a small area which is cultivable —this being where the river bank here and there spreads out into small plains; and these become fewer as one travels westwards. Surprisingly small as the amount of cultivable land is in this huge province, which (like Kwangtung the neighboring province) is of about the area, roughly speaking, of Great Britain, the thinness of the population is all the more remarkable. All the land which is culturable is by no means under cultivation—as is the general impression in regard to China—and this shows the paucity of population relatively to the enormous area of the province." Mr. Colquhoun writes, of course, with his voyage from Canton in his mind, and what he says shows the wisdom of the Chinese in wishing to cut down from Nanning to the best port near at hand rather than prolonging the railway in competition with the river right through to Canton as used to be urged. It is, of course, logical for the Chinese to wish to have their own port to compete with Haiphong, and it is wise for them to shorten the railway journey from Yunnan to the sea if they hope to develop a large freight traffic, as no doubt they do. No better port than Yamchow is available. Although Pakhoi has long been an "open port," it has not the harborage facilities. It is an open roadstead, at which steamers are compelled to lie a mile from the beach, and all cargo handling has to be done with lighters and junks, which often cannot, owing to the state of the weather, carry on the loading. Yamchow, it is hoped, will overcome these disadvantages, but it will not destroy the trade of Pakhoi. Certainly the railway, if built, will derive more advantages from having its seaport at Yamchow than at Canton, as has been urged, and if the

coal in the vicinity develops necessary qualities for manufacturing purposes who is to say that Yamchow will not yet spring into an important industrial centre where the minerals of the hinterland might be transformed into useful materials for shipment to other parts of China and abroad?

All the regions which a line from Yamchow to Yunnan and Szechuan will tap are rich in minerals, as has been said before, and, as has been shown, the chief reason for neglect properly to mine them is the lack of transportation. The only means of transporting products from Yunnan by the West River route is to have them carried on pack mules or coolies' backs over long distances, and then float them down stream to Nanning in small boats. The traffic is attended by so many difficulties that it is impossible for it to develop as it should until a railway is constructed. Already, however, there is a steady trade in the staples already mentioned, which are brought down from the country to be shipped from Nanning to Canton by the West River. The head of navigation on this river is Poseh and any railway to Yunnan must pass through the valley of the Yuh-liang to this port. The country alternates between mountains and low lying plains the ascent being gradual but not anywhere near as difficult as the passage up the valley of the Yangtsze into Szechuan. Open country obtains for a short distance from Nanning and gives way to low, bare undulating country dotted with small villages, and later the river runs through walls of lime-stone with queerly serrated ranges in the near and far distance, now rushing through grim narrow gorges, again breaking into "a splendid vista of champagne country, undulating and verdant, lying on either side of a long straight reach." Above Hangan the limestone ranges press closer to the river, their picturesqueness being attractive to the tourist, but their formation disconcerting to the engineer. West of Shung Lamhu, however, these grotesquely shaped mountains disappear and fields of corn dip to the river's edge, the country being cultivated for extensive areas, the hills in the back ground rolling, away in easy undulations. Practically to Poseh where red sandstone bluffs touch the river, the country is cultivated, the level to the serrated hills being broken by rounded knolls, villages being noticeable at varied intervals.



A rough section of the Yunnan-Tonkin Railway

Poseh is the trading centre for Yunnan and Kweichow so far as southern China is concerned. It is situated at the junction of an affluent with the main river and is built on rising ground. It always maintains a busy air, the junk and sampan fleets generally being large, while the overland trade combined with the tile and pottery works in the vicinity give it a thriving and busy appearance.

From Nanning to Poseh no actual survey has yet been made, but a rough estimate of cost was prepared two years ago by Mr. K. S. Low at the instance of the authorities. He advocated that no railway be built between Nanning and Canton, but between Nanning and Hengchow, and thence south to Pakhoi, the only port on the coast in general use. Between Poseh and Nanning Mr. Low estimated the 150 miles of country to be two-thirds level and one-third hilly, the cost of constructing a line over which would be Taels 75,000 per mile on the level country, and Taels 100,000 on the hilly, or, for the whole length, about Taels 12,500,000. His total estimate for the line between Nanning, Hengchow and Pakhoi was about Taels 11,500,000

From Poseh to Yunnanfu an instrumental survey was made by Mr. Low, and a reconnaissance over two routes was carried out by Messrs. W. S. Dawley and Arthur J. Moore-Bennett. Near Poseh the country along the river is flat and highly cultivated, but three miles away precipitous cliffs abound, rising up to 200 feet above the river with the strata dipping ten degrees to the horizontal. Hills later slope down to the water's edge and continue so, being covered with timber and bamboo groves.

The city of Yunnanfu is surrounded by a fine brick wall, 30 feet high and measuring about 4½ miles round. As is generally the case, a very large part of the population live in the suburbs, which extend to a considerable distance round three sides of the city. Yunnanfu stands at a height of 6,700 feet and its climate is never hot, 85° in the shade being about the maximum summer temperature. Although there are frosts in winter no very severe weather is ever experienced. The population is estimated to be 80,000. Yunnanfu can boast of a new modern gaol; a Government medical school and an up-to-date arsenal.

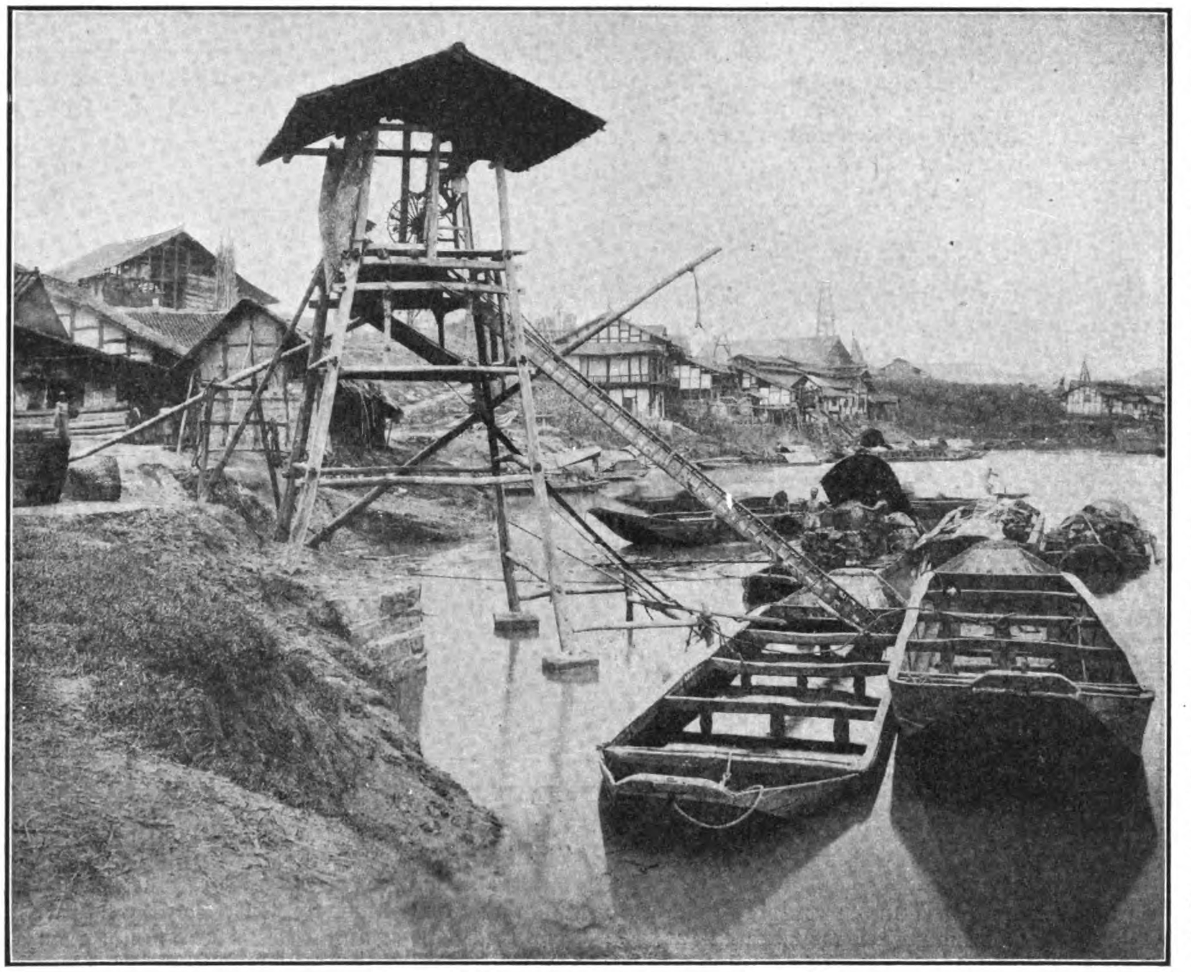
Mr. Low commenced his survey in the spring of 1910, fixing the elevation of Poseh, at 1,000 feet above the sea level. Except for the divide between the West and Red Rivers easy grades were found along the course of the river over the western corner of Kwangsi province. The country passed through was thinly populated and not very productive, the population being chiefly of the Maiotze tribe, who have, it may be incidentally mentioned, solved the suffragette problem to a nicety. The man minds the baby while the woman works in the field. If the man has several wives the comely ones go to market and do the trading while the plain ones labor with the hoe and the reaper. When the railway goes through the section—if it ever does—the navvies will be the womenfolk of the country, if there are sufficient of them to be spared from their farms.

No difficult country was encountered up the river valley, but at the crossing of the Red River, which here constitutes the border of Kwangsi and Kweichow provinces, serious obstructions began. A reconniassance of the Red River to a point about 115 miles from Poseh showed that the river could not further be profitably followed, tremendous gorges barring the way. The trade route leaves the stream and strikes to the plateau of Shingyi, the elevation rising in about ten miles from 1,989 feet to 4,913 feet,—a rise of 2,924 feet. A range of mountains running approximately east and west was cut through by the Red River, and in this section not even a footpath could be found. Exploration of the Kweichow territory in the vicinity and the adjacent region of Yunnan yielded nothing in the shape of an easy passage, the passes being high and the gorges impossible, so the engineer decided to climb the plateau of Shingyi instead of following the river route, a determination which was only come to after three months' active reconnaissance of a country through which the drainage percolated into the hills, streams flowing through subterranean channels rather than on the surface, and issuing at the foot of hills through holes varying from a foot to thirty and fifty feet in diameter. The range running east and west drops almost abruptly to the valley of the Red River, all the drainage of the Shingyi plateau percolating through it, but being an open slope it is possible to climb it easily, a grade of from 2 to 3 per cent. being obtainable.

From Shingyifu (130 miles from Poseh) Mr. Low located his line approximately along the trade route to Shingyi-hsien (175 miles from Poseh), a great centre of trade for Kweichow and Yunnan and the Canton provinces. In the palmy days of opium the trade centred at this town and millions of dollars were sent there yearly to make the purchases, foreign and other

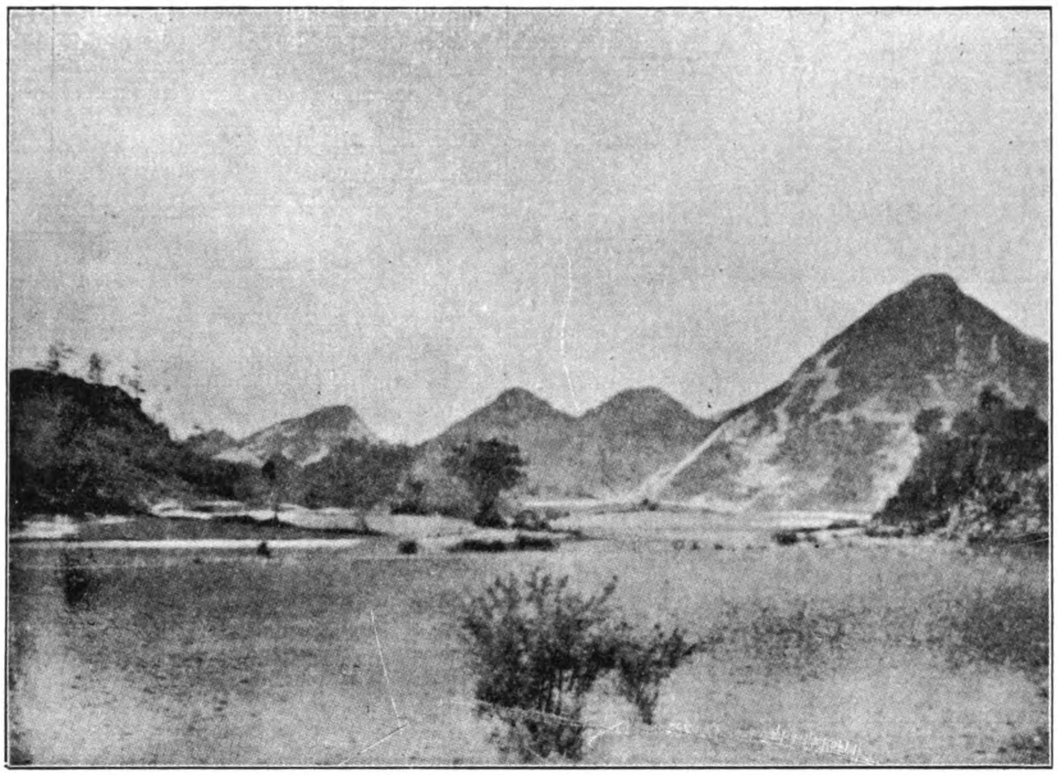
merchandise following to recapture the silver. The prohibition of opium-growing has destroyed the superficial prosperity of Shingyi-hsien, and the region, and the poverty that has been caused is distinctly noticeable, though the farmers are now planting wheat and other cereals. Old women and young girls, men and boys, are constantly encountered without sufficient clothing to wear, though they have abundant food, the plateau being rich and productive. The difficulty is that there is no market for the grain, and consequently the opium has not yet been replaced by anything which will enable the producers to secure the wherewithal to purchase the cotton yarns, the piece goods, and the materials which they were wont to buy when opium was such a profitable, easily-handled crop. A railway will be the saving of this large rich wheat and grain growing region, and, since the climb from the Red River was practicable, immediately to tap this plateau, it was one of the strongest reasons which influenced Mr. Low to carry his line that way rather than pursue the Red River with all its precipitous gorges, almost impossible locations, and at the same time, much longer route. The staple food of the people of this part of the country is rice and native corn.

After traversing the plateau in Kweichow province the line crosses the Red River valley into Yunnan province, and proceeding up one of the branches of the Red River is able to take advantage of a rich level stretch, affording easy construction. As a range of hills divides this stream from Loping (230 miles from Poseh) that city will not be touched. Not only do the hills isolate Loping but they break up the rich valleys and compel a line to be located through gorges and along stiff hillsides, the streams in many places disappearing and flowing in subterranean caverns through the ranges, the entrance and exit of the water being separated in some cases by as much as two or three miles. Happily, a side stream was discovered through the valley of which a line could be built without high grades or much tunnelling. Thence to mile 230 from Poseh the route passes through comparatively level country. Notwithstanding that the country from this vicinity is most difficult, topographical advantages offer and by these it is possible to escape from the difficulties. At Tek Lai-po, (280 miles from Poseh), near the source of a branch of the Red River, the location leaves the valley of the Red River and crosses a range into the valley of Kutsingfu. The range runs approximately east and west to I-ling, on the French railway, but as Mr. Low's official instructions were to select a route obviating the necessity of junctioning with this railway south of Yunnanfu, he decided, after carefully traversing and examining the range to the existing railway, that the spot chosen for the crossing was the easiest discoverable. In this section the mountains are most precipitous, the surveying party being compelled in many cases while searching for an easy crossing, to steady their slipping mules down descents by hanging to their tails. Round Teh Lai-po coal exists in abundance; it has no value; walking on the highway lumps are stumbled over; when the native wants to revive his fire he walks into his back yard and digs the fuel; a mule load can be purchased for 50 cash, and in the city it is sold for a little higher price. The country is dotted with crude charcoal furnaces and blast furnaces 15 to 20 feet high; iron exists in abundance, the hills being denuded of timber to supply the charcoal for the smelting; wrought iron is sold in blocks, and from this the natives have been long accustomed to make their household and farming implements. Once opium thrived; now corn replaces the erstwhile blooming poppy, rice being cultivated in the lowlands; but lack of communication with a market deprives foodstuffs of its value. The country being too cold for cotton cultivation, clothing is scarce, though the natives in the hills grow hemp from which to weave coarse garments. The valleys are cultivated by Chinese, the aboriginals living in the mountains, the Chinese being mostly descendants of the soldiery engaged in the conquest of Yunnan, men who originally came, according to their descendants, from Kiangsu and Hupeh provinces. The aboriginals, speaking a different tongue, having different customs, mix very little with the Chinese, nor do they contribute to the development of the territory which they occupy. Agricultural and industrial effort is confined to the Chinese, but they exist in sufficient numbers in the cultivable valleys to provide a nucleus for much trade in the event of railway communication being opened.



Pumping Brine from Lighters at Suifu, Szechuan

Upon crossing the range the route lies along the valley of the Kutsing river, which is one of the richest valleys of the Yunnan province and which extends for a hundred miles from Kutsingfu (304 miles from Poseh) in one direction to I-lang, on the French railway. Here the river, like many others in China, flows in a bed higher than the surrounding country, being confined by high banks, which the Chinese are constantly increasing in height to prevent overflowing, instead of deepening the river. If the Chinese would realise that one cubic foot of silt taken from the bed of the river is worth ten cubic feet of soil placed on top of a dyke



On the Weining Plateau

they would avert many a disaster, and this fertile valley is now threatened by this miniature Yellow River which purls its elevated way along it. Yunnanfu derives much of its agricultural produce and fruit from this valley, all varieties flourishing in abundance.

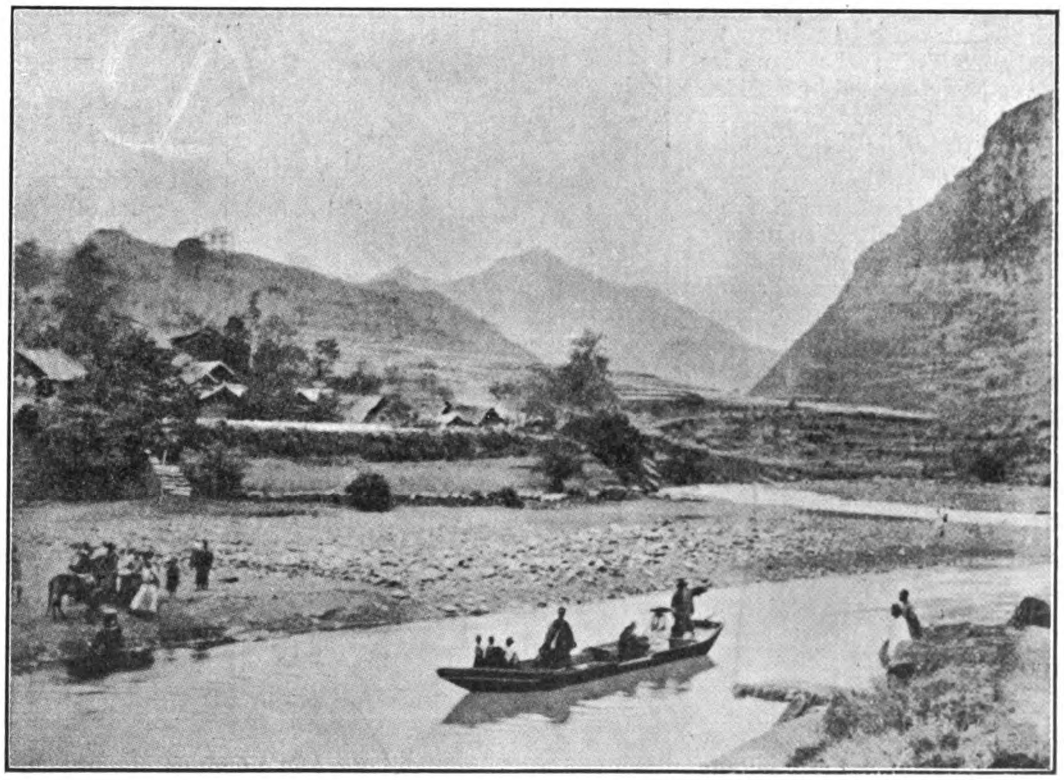
At Kutsingfu Mr. Low's survey was stopped by the revolution, but as the remaining distance to Yunnanfu had been surveyed by Major Davies, the description of which is given later on, there was scarcely any need for a second survey to be run over the same route.

Mr. Low, had three parties at work to conduct his survey and in his report he provided an approximate estimate of costs, placing the total from Poseh to Yunnanfu, about 435 miles, at Taels 51,000,000, which, added to Taels. 23,500,000, the cost from Poseh to the coast, would give an approximate total of Taels 74,000,000 from the sea to Yunnanfu.

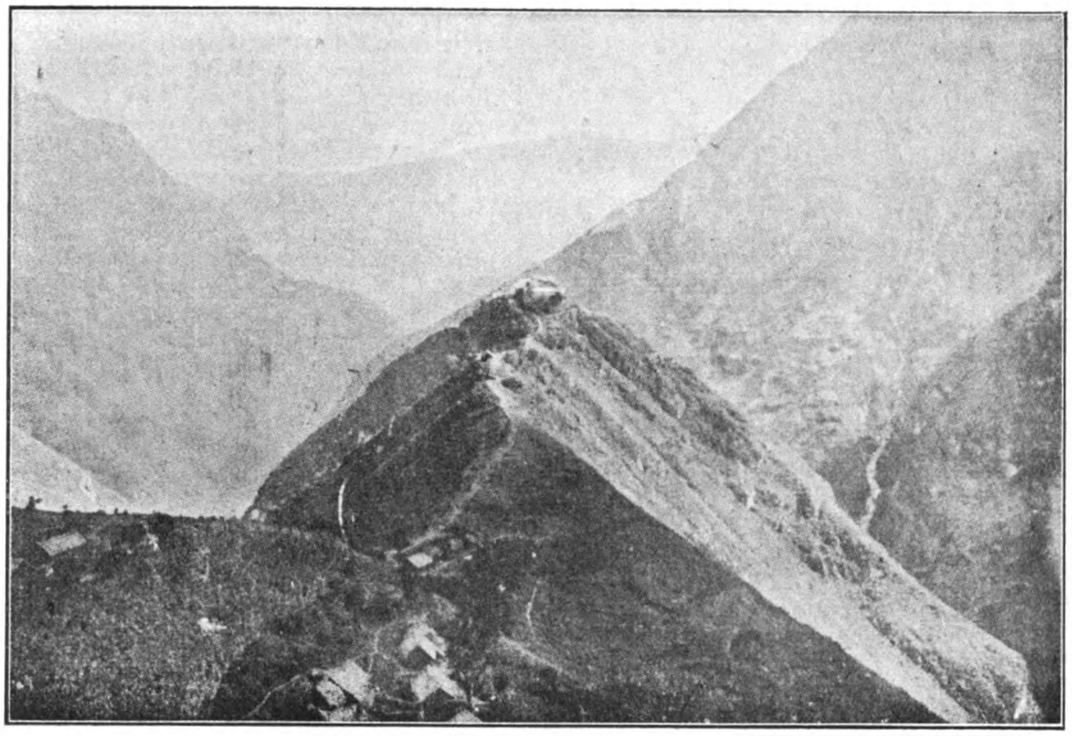
A route estimated to cost £5,640,000, from Yunnanfu to Poseh, and a route different from that surveyed by Mr. Low, was reconnoitered by Messrs. W. S. Dawley and Arthur J. Moore-Bennett, but their line starts from a point on the existing French line south of Yunnanfu, taking off at I-lang, and therefore handicaps it by having a terminal in the hands of what would be a competing company. This survey is mentioned in the article appearing in another column from the pen of Mr. Moore-Bennett, and while the writer claims for it a cheaper cost it is questionable if it would serve the purpose of the Chinese as well as a line running further east and tapping Yunnanfu from a direction different from that occupied by the French. The French line follows the only available route from Yunnanfu southwards, the rugged mountains preventing any wide divergence, though the Chinese could, of course, build their own line parallel with the French one to I-lang, if they so desired, and if protests did not emanate from the French Company holding the rights of the line from Yunnanfu to the sea in Tonkin. That they would protest is certain since any line from Yunnanfu down the West River valley to the south-China seaboard would kill their Chinese goods and passenger traffic. For this very reason, too, it is more than probable that the French are not likely to take any early steps to float a loan to China to establish competition with the French owned line in Yunnan that would certainly prove disastrous. The fact that China has given the agreement to French capitalists will deprive her for some time of a line which she ought to have into Yunnan unless she is able skilfully to play her cards, or bring some sort of pressure to bear to have the agreement brought into effect. The French raison d'etre of the agreement was twofold, first to obtain the right to the line from the south coast to Yunnanfu, and thus prevent any nation from securing it, and second to obtain the right to the line from Yunnanfu to Szechuan, a line that will be built if possible, and if other nations do not successfully oppose it, in order to give France the domination she requires and also to benefit the line already existing. France aims at securing the handling of all trade south of the Yangtsze, and she could easily do that did the railway company not act so injudiciously with regard to freight rates.

From Yunnanfu to the Yangtsze

Although the route between Yunnanfu and the Yangtsze has been much travelled, and has been the subject of preliminary reconnaissance by Major Davies and Mr. Dawley for a feasible railway route, the fact remains that the wild mountainous character of much of the country demands closer attention before a line can definitely be decided upon. Major Davies sums up the investigations of his party in favor of a line through Weining, reaching the Yangtsze at Suifu, 1,500 miles from the sea, the alternative route from Weining to Nachi, opposite Luchow, being so difficult and through such intricate country, that rack lines of 1 in 16 and 1 in 12 would be necessary, though the last



Ferry over the K'o-tu Ho, in North-western Kweichow



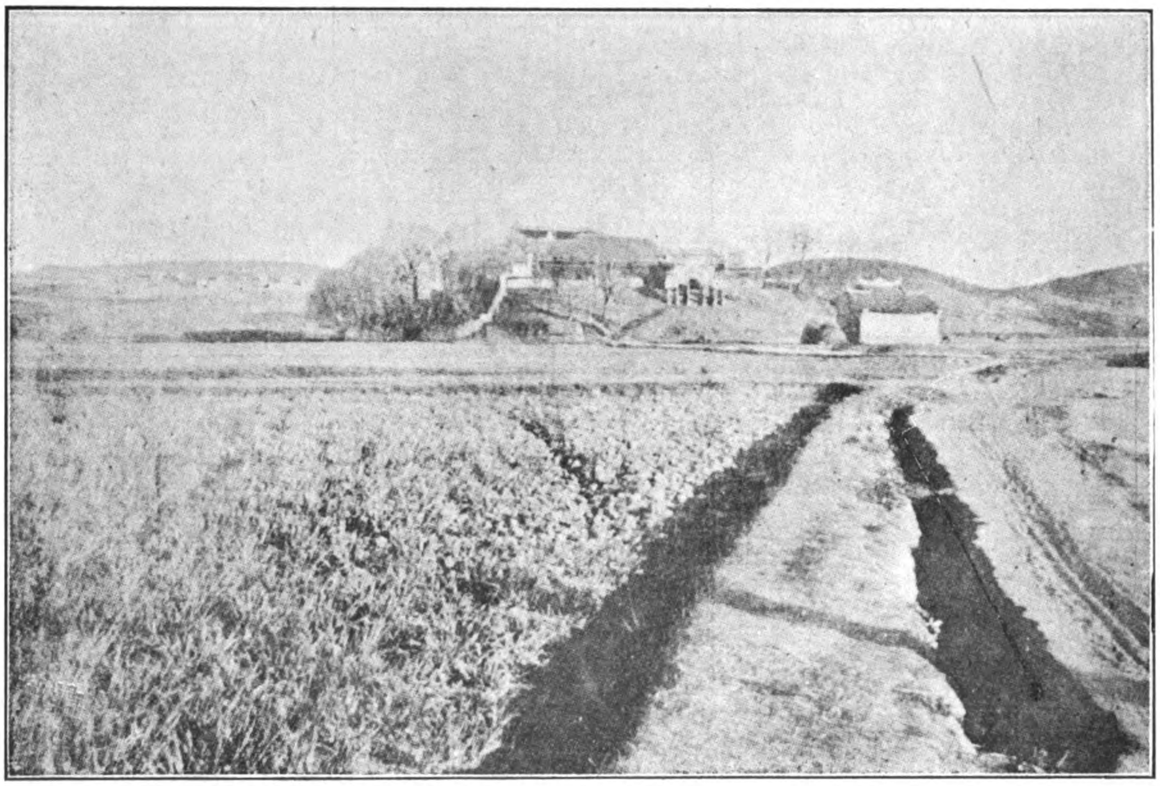
A Valley in Yunnan, near Chaotungfu

nanfu the Yiliang plain, lying at 5,300 feet—an exceptionally low one for this part of Yunnan—is reached, and the third day a large plateau with an elevation averaging 6,000 feet is ascended. Two days and a half over gentle undulations through bare and dry country, bearing poor and scanty crops; traversed everywhere by carts; marked by peculiar pillars of sandstone rising 20 feet in the air, brings the traveller to the north end of the plateau where it precipituously descends to the Kutsing river. A fine thirteen arch stone bridge, 120 yards long, crosses this tributary of the West River and permits a dry shod entrance to Lu-liang, a poverty-stricken town, but with a reputation for scholarship. One of the finest plains in Yunnan, extending for over fifty miles with an average width of about five miles, is traversed to Kutsingfu. The northern portion is very fertile, while the south is not so well irrigated and crops are poor. Northwards further undulating country is crossed, marked by a series of little cultivated plateaux, with low rocky hills raising out of them, and most of them without any running water. Coal is plentiful and hardly anything else is used as fuel, 200 cash a cartload or about Mex. $1.50 per ton, being the selling price.

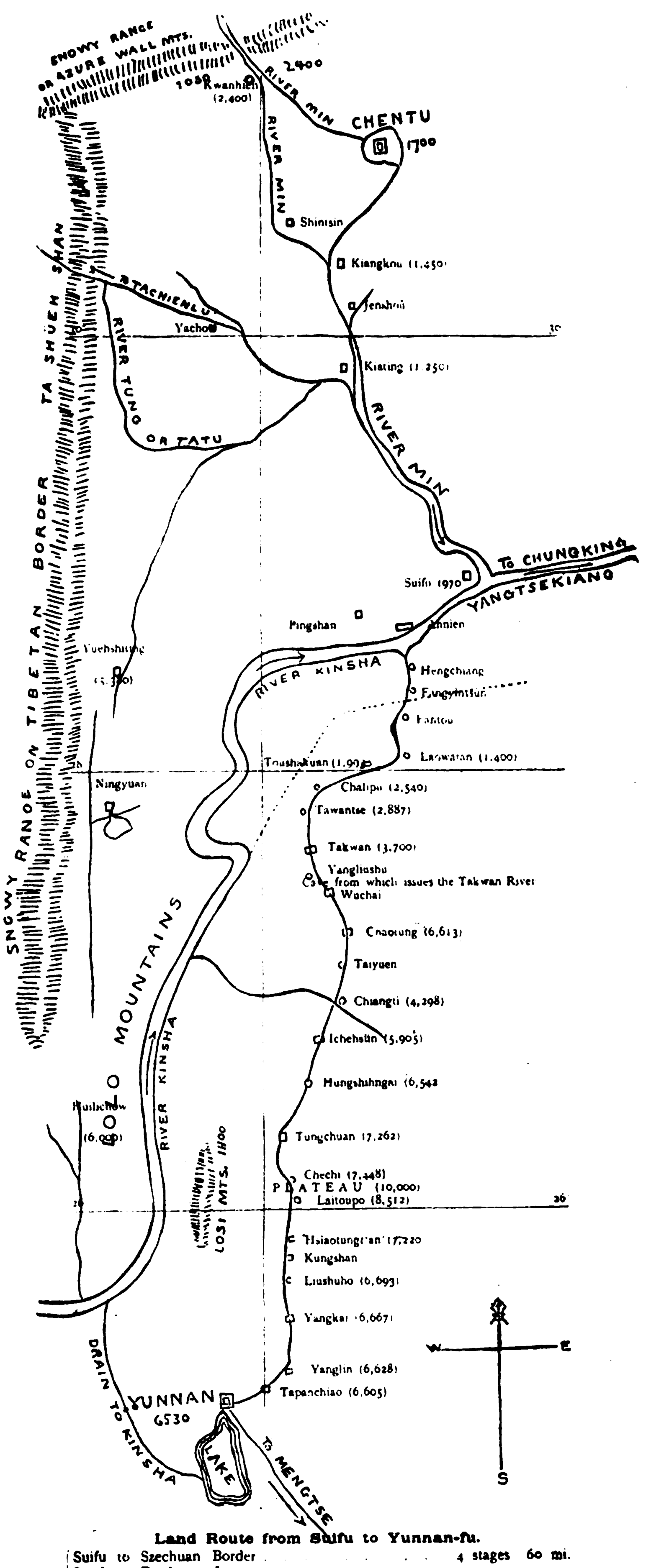
Coal mines which might be extensively worked if better means of communication are supplied have been opened all around Suanwei. Two days march further north copper is also mined in many places. Steep hills are ascended and sharp descents traversed before the Ko-tu river—1,000 to 2,000 feet lower than the neighboring valleys,—is reached. It is the longest source of the West River, and marks the boundary of Yunnan and Kweichow provinces. Dry hilly country marks the way to Yaochan, where copper is mined out of the solid rock, caves being cut in the hill-sides by the miners. There are no deep shafts, the miners working with hammers and wedges, and producing an average of a mule load of ore in two days. The

fifty miles to the Yangtsze would follow the Yungning river and be comparatively easy. The thought of a rack road is sufficient to put this route out of question, and until more is learned by close investigation by surveyors it must be discarded in any discussion on the subject. Major Davies, therefore, marks down as possible a line from Yunnanfu, through Kutsingfu, branching north-westwards from Weining, through Chaotung to Suifu, but in that there are very steep ascents giving grades as steep as 1 in 25. For the first fifty-five miles from Yunnanfu the road passes over rolling plains, but from the north end of the Suanwei plain a line would be difficult for 70 miles, with steep gorges to negotiate. Beyond that to Chaotung the road is fairly easy, but further on difficult gorges have to be traversed down the course of the Heng river to Takwanlao, over a hundred miles from Weining. On the lower part of the Heng river the road is fairly easy for the next 90 miles to Suifu, the Yangtsze river being crossed by a bridge at Anpien, some 15 miles south-west of Suifu, 425 miles from Yunnanfu.

The present traffic from Yunnanfu to the Yangtsze is carried over one of two main roads, one passing through Tungchwanyun and Chaotungfu to Suifu, and the other running along the telegraph line through Kutsingfu, Suanwei and Weining, striking the Yangtsze at Nachi. On the way from the capital across the Yunnanfu plain the traveller is impressed by the rows of cypress trees growing along the embarkments of the irrigation canals, by the hand wheels used to lift the water from lakes and ponds, and by the small carts drawn by a bullock or a buffalo, not for the purpose of transportation, but for farming operations. Two days journey from Yun-



Country near Chaotungfu, Yunnan



Land Route from Suifu to Yunnan-fu.

Suifu to Szechuan Border	4 stages	60 mi.
Szechuan Border to Laowatan	2 ,,	20 ,,
Laowat'an to Chaotung	6 ,,	132 ,,
Chaotung to Tungchuan	5 ,,	107 ,,
Tungchuan to Yunnan-seng	7 ,,	152 ,,
	24 stages	471 mi.

10 mi.

ore varies a good deal in quality, and sells at about 25 cents for 100 lbs. the best being said to produce 10 per cent. of copper. The copper is sent to Kweiyang, the capital of Kweichow Province, where it is minted into cash.

The hill tops in this part of the country rise to 8,000 feet and form the water shed of streams which feed a large lake near Weining, a poor town with an elevation of 7,500 feet whose importance lies in the copper, silver, lead, iron and zinc mines which abound. The people in the region showed much hostility to Major Davies' surveyors, rolling stones down upon them from the mountain heights, and shooting at them, but always running away if chased by the surveyors. Boilers and mining machinery had been bought and transported to this place by the Yunnan Government but never used, copper mining on an elaborate scale not paying on threepence per pound, the price given by the Government for the product.

The route thus far, judged from the point of view of railway construction, may be described as difficult. After leaving the Suanwei plain an intricate mass of mountain chains is encountered, while, to make matters worse, right across the route which the railway must follow, runs the Kotu river, 1,500 to 2,000 feet lower than the neighboring valleys. Captain Watts-Jones, one of Major Davies' party, reported that the country would be quite impossible for a railway were it not for one feature—the valleys are flat at the bottom and fairly broad, generally 50 to 150 yards, and seem to have no sudden drops. The stream spreads over half of the valley but is always very shallow, and fields a foot above the stream seem to escape serious flooding. Taking advantage of this conformation of the ground the surveyor was able to find a fairly practicable route, chiefly following the river valleys to Weining (7,500 feet.)

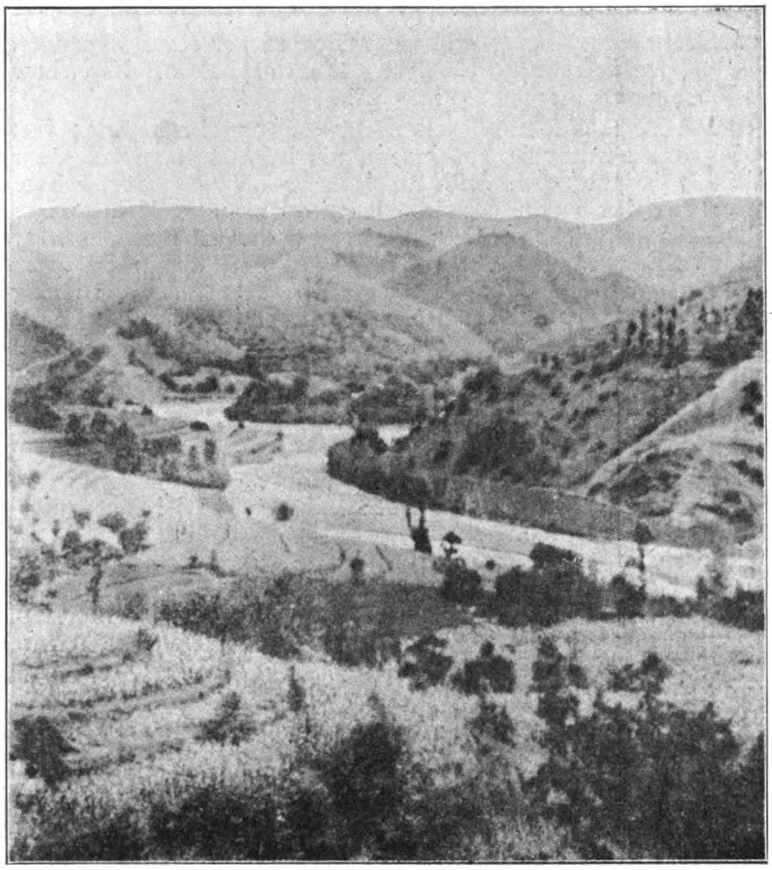
From Weining, 225 miles from Yunnanfu, two different routes were reconnoitered to the Yangtsze, one via Pichieh to Nachi, and the other via Chaotung to Suifu. Along the first route the country is extremely difficult between Weining and Yung-ning. Some very heavy gradients are necessary to get over the ranges of hills, and the river valleys, often running through steep-sided gorges, do not lend themselves to railway construction. For a few miles rack lines on 1 in 16 and 1 in 12 would be necessary. Should it be advisable to adopt this route the work would be very expensive. From Yung-ning, fifty miles from the Yangtsze River, the work of construction would to comparatively easy with no very steep gradients.

The route via Chaotung, would, as far as that city from Weining, lie over open rolling downs, and there is only one difficult bit, where at Taotienpa an affluent of the Niu-lan river has cut out its valley below the level of the Chaotung plain.

From Chaotung onwards the line would have to follow approximately the main road, that is to say, it must cross a low pass at the head of the Chaotung plain, and thence follow down the banks of the Heng Chiang to the Yangtsze. The upper part of the Heng is decidedly difficult, with a bad gradient and very steep side-slopes. Mountains tower on all sides. Lower down, the valley gradually improves for railway building, and where it debouches at An-pien there is a good place to bridge the Yangtsze, and from there on to Suifu is fairly easy.

Coal and minerals occur throughout this region and near Suifu, coal is mined high on the cliffs above the river. According to Capt. Thos. W. Blakiston, it is practically straightway shipped into junks from the pit mouths. His description of the operations shows that "having to be got at a great height up in the cliff, very thick hawsers, made of plaited bamboo, are tightly stretched from the mouth, or near the mouth, of the working gallery, to a space near the waterway where the coal can be deposited. These ropes are in pairs, and large pannier shaped baskets are made to traverse on them, a rope passing from one over a large wheel at the upper landing and down again to the other, so that the full basket going down pulls the empty one up, the velocity being regulated by a kind of brake on the wheel at the top. At some places the height at which the coal is worked is so great that two or more of these contrivances are used, one taking it to a landing half way down, and another thence to the river. The hawsers are kept taut by a windlass for that purpose at the bottom."

Mr. Dawley's route leaves Yunnanfu, via Yanglin, Sungming, Tungchwan-yun, Chaotung, Anping and Suifu.



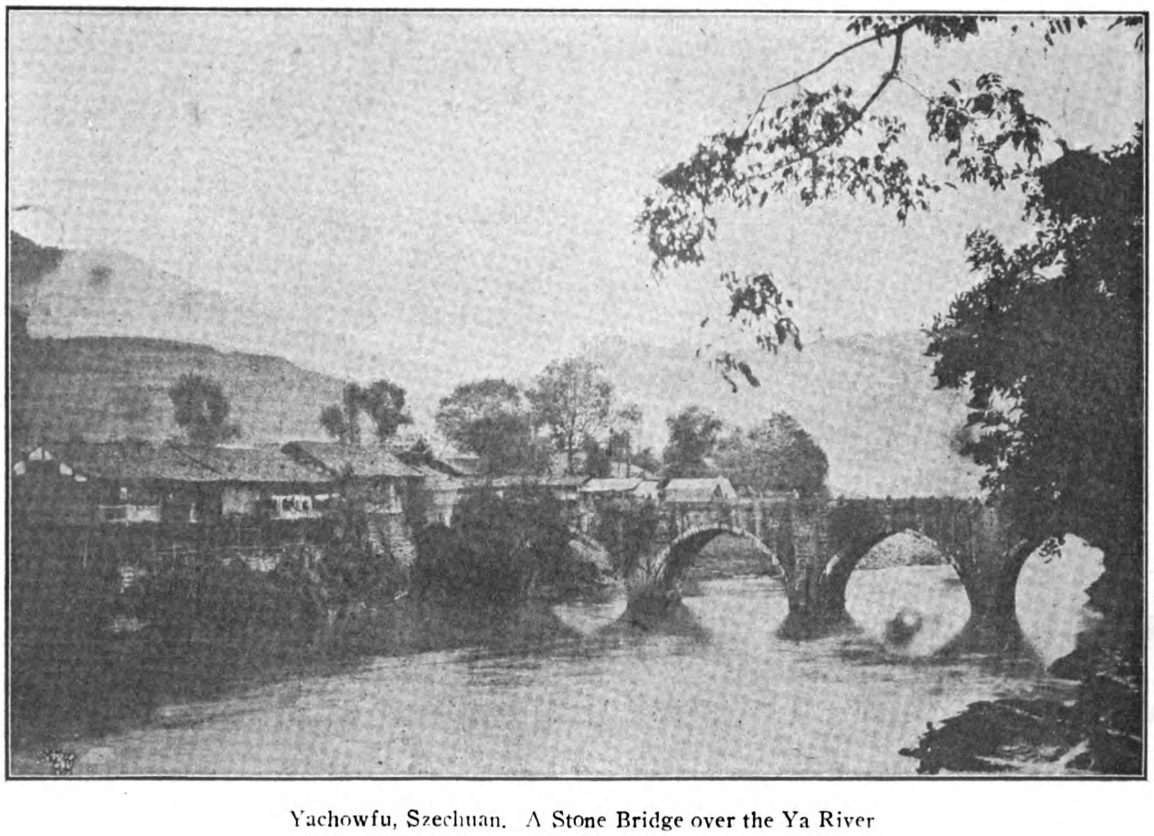
Near Tong-ch'uan-fu, Yunnan

The line would descend from the limestone ridge on which Yunnanfu stands and cross the plain with its limestone pinnacles, serrated ridges, and crags. A paved road over undulating moorland now leads to Yanglin, 7,000 feet above the sea, and 800 feet above Yunnanfu, and leads thence over a great plain of rolling country traversing timber, and mounting ridge after ridge till a narrow valley between high steep mountains ascends to a pass 1,800 feet high. Another 500 feet leads to a plateau studded with rounded hill tops, with ranges in the far distance, cultivation being carried out in the intervening spaces. The crossing of a range 2,000 feet high opens up the plain of Tungchwanyun, a fertile, irrigated stretch, with numerous villages nestling by canals carried between high dykes. Small boats navigate these streams and give intercommunication to the villagers, a poor, hardworking people suffering from the extortion of gentry and officials who own most of the land and who live in comfort within the city walls. The plain gives way to another mountain ridge, the road crossing a pass 9,000 feet high, followed by narrow valleys inhabited by rice-growing Chinese, who occupy comfortable farmhouses. Limestone ridges are ascended in succession, with fertile plains between, till near Chaotung, a suspension bridge of handsome design, with solid brass lions and monkeys at either end, spanning the Niu-lan river, over 100 feet wide, and giving access to Chaotung, a walled city 7,000 feet above sea level. The plain is dry, fertile and rich and is surrounded by rugged mountains, the crops harvested being large and consisting of maize, oats, barley, buckwheat, potatoes, etc. The plain extends ten miles with a width of about twenty, the road eventually climbing uplands on to another plain bordered with limestone ranges, whence a descent is made after crossing the Lohan-ling pass. What is known as the Yunnan plateau is thus left behind for country of quite different character. The difficult road leads between high limestone cliffs, the view from the heights being one of rolling mountains or jagged peaks. A tortuous and difficult descent of the "Corkscrew" pass, a drop of 4,000 feet, eventually takes the road over a handsome suspension bridge 75 feet long spanning the rushing torrent to Laoyatan, a city of 20,000 inhabitants, 2,000 feet above the sea, and 200 feet above Suifu. Cliffs up to 600 feet high, with limestone ranges closing in on the valley, mark the way north to Suifu, the river tearing between precipitous gorges. The road becomes narrow and broken as it leads over steep ranges and eventually passes through spectacular limestone mountains, scarred, serrated and fluted, to Anpien, thirty miles from Suifu.

The bed for a railway could be laid along this route, Mr. Moore-Bennett says, for £7,000,000, there being but a few engineering difficulties, though at times heavy grades.

Suifu (800 feet) is a walled city which handles the transit trade coming down the Min river—navigable for hundreds of miles—from Chengtu and that section of the Red Basin tapped by the tributaries of this important river. It is, too, the centre of an excellent coal area, as well as being considered the head of deep water navigation on the Yangtsze. The region is very mountainous and near here "all the barriers of the western highlands touch on the confines of the Red Basin." The city is a large distribution centre, and is advantageously situated at the junction of the Min and the Yangtsze. Most of the import trade of Szechuan passes via the Min, its affluents, and the numerous canals connected with it. In addition to the exports of wheat, barley, oats, corn, rice, hemp, white wax, medicines, nut galls, pig's bristles, rhubarb, fungus, hides, tobacco, lead, zinc, etc., coming from the Red Basin, it also handles the gold, copper, furs, skins, musk, wool, etc., brought in from Tibet and western Szechuan.

To take a railway to Chungking another bridge would be necessary to cross the Min river, and thence the line would probably pass through Nanchi-hsien to Luchow. One estimate places the cost of building at about Taels 100,000 per mile, this far the mountains not being excessively difficult. From Luchow,



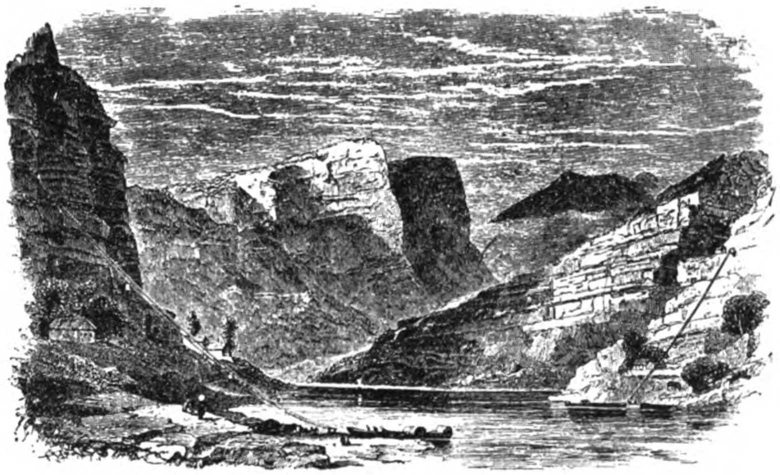
Yachowfu, Szechuan. A Stone Bridge over the Ya River

Near Sui-fu, Szechuan

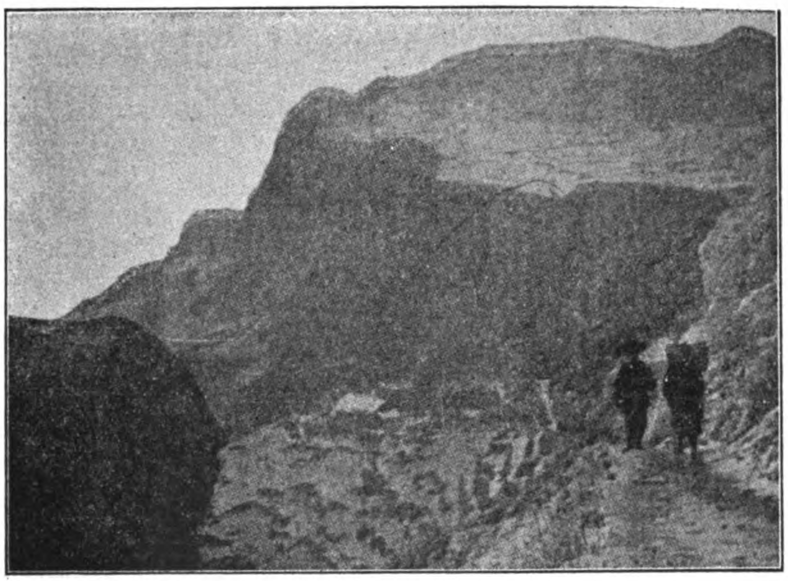
On the road from Chaotung to Yunnan

where the Lu river would be crossed, the ranges become more persistent and the road runs north-east to Yungchang-hsien (1,220 feet) about twenty miles from the river, the next twenty-five miles to Chungking being almost due east. The cost of the line from Luchow to Chungking would run probably to Taels 110,000 per mile, or a total of Taels 15,000,000 for the 145 miles.

The railway from Yunnan to Chungking is designed, of course, to give the French port of Haiphong direct connection with the important commercial centre of Chungking, and with Chengtu by the railway to be built by the Hukuang Group. Naturally it would tend to diminish in a measure the traffic which the builders of the Hukuang system hope to derive from their lines. When they planned the line from Hankow to Chungking and Chengtu, they anticipated collecting the trade at both centres and picking up what might come down river by junks or steamers from Suifu and the Min river valley. If the French line to Chungking is built it will, if freight rates are favorable, do much to draw trade towards the Indo-China seaboard, not only from Chengtu, via Chungking, but also direct from Chengtu by way of the Min river. This is an aspect of the matter which has probably not escaped the attention of the Hukuang Group, and realisation of it will very probably compel them to come to some arrangement to have the section dropped by the French even if the line to Suifu is constructed. However, French aims are not likely to be subor-

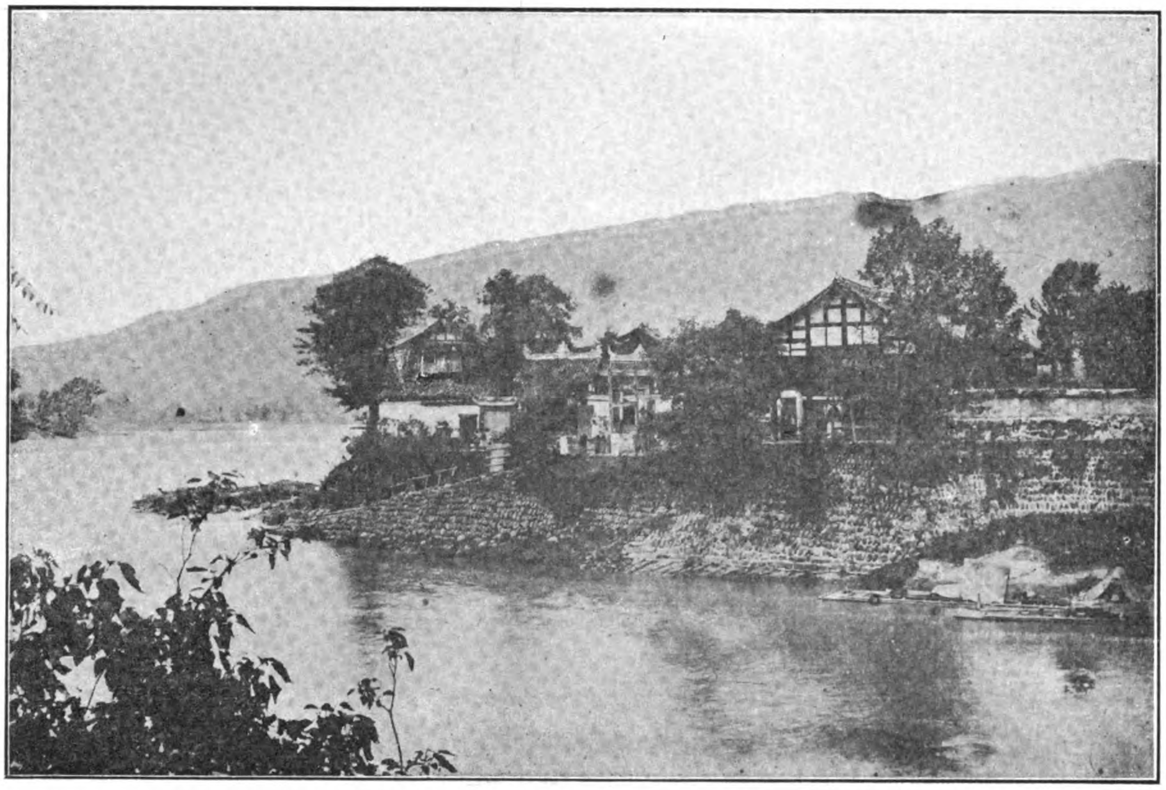


Coal Gorge on the Yangtsze (Blakiston)



Parrots Beak Mountain, Yunnan

Tea Carriers, Carrying Tea into Tibet, each bundle weight 250 lbs.



The Ya River at Yachow, Szechuan

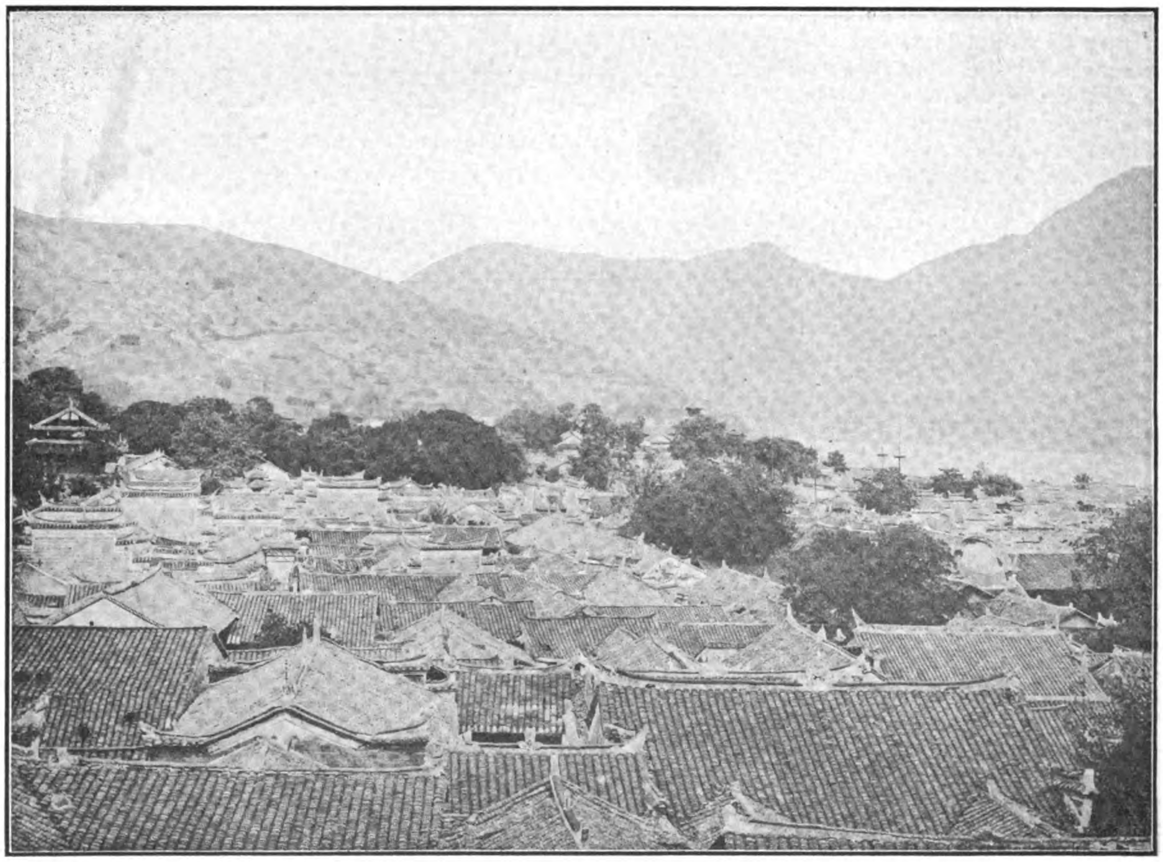
dinated to other considerations. The French have secured what they have been long seeking, the right to build a line through Yunnan to Szechuan with Chinese money and not their own—as was employed on the Tonkin-Yunnanfu railway—and it is inconceivable that they will lightly give their long-cherished ideas up, or even modify them, without a desperate struggle. It is the obvious task of the Hukuang Group, of course, to minimise competition with their costly line, and it will be interesting to see whether any steps will be taken with this end in view.*

From the Yangtsze to the South-west of Kweichow Province

While the problem of opening railway communication with Szechuan and Yunnan provinces has been on all men's minds—that is all men interested in the west of China—for many years, little has been said of the desirability of specially considering the claims of Kweichow province. That, of course, is understandable. The Yangtsze gave access to Szechuan and to Yunnan, while Kweichow has been hidden away behind its mountains practically unknown, having no rivers to command attention, and most difficult highways to dampen the ardor of the mere seeker after commercial possibilities. It came somewhat as a surprise, then, when it was announced that an agreement had been signed with the British firm of Pauling and Company for the construction of a railway from a point on the Yangtsze, opposite Shasi, to Shingyi, a name on the map in the south-west of Kweichow, but unknown in the geography of the general student of China. Yet this line is one of exceeding importance, both to Kweichow and Yunnan, as well as to the Central Government.

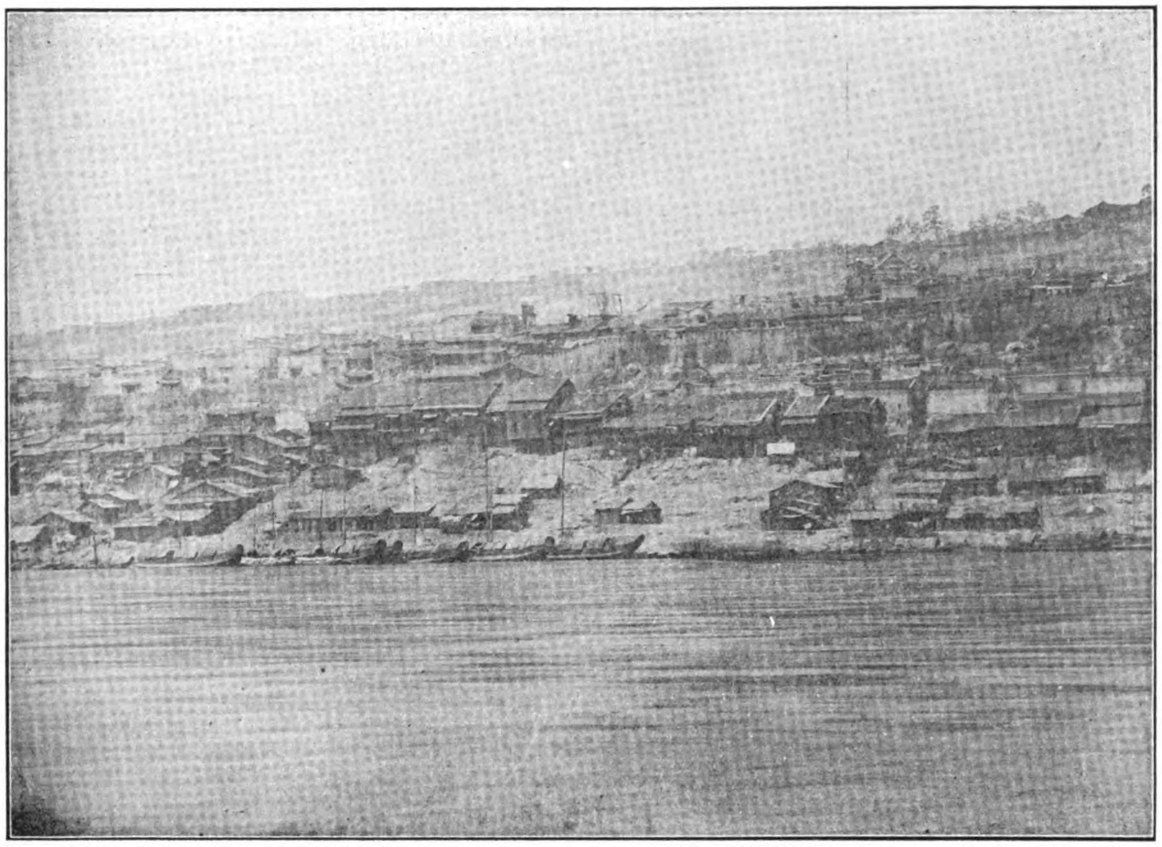
After travelling through Kweichow with the Blackburn Chamber of Commerce Mission Mr. F. S. A. Bourne set it down in the report of the Mission that "in no part of China would railways be of more advantage to the country than in this province, where there is no water traffic at all except on the eastern side, and there very difficult." The best road to follow would be through Hunan to the Yangtsze, near Hankow, a line which, Mr. Bourne hazarded, would pay at once.

The railway which the Chinese Government propose shall be built will follow the trade route from Hunan, and a point opposite Shasi, on the Yangtsze, some miles west of Hankow, was selected as the starting off point owing to the impossibility of building a railway across the low-lying, semi-flooded country to the south and south-west of Hankow. As direct rail connection with Wuchang, opposite Hankow will be impossible, either a branch line will be run from the Hankow-Szechuan line to Shasi, which could be reached by a ferry across the river, or water connection with Hankow will be availed of. Shasi is growing important enough to merit the connection with the



The City of Kweichow, situated on the Yangtsze River, Szechuan

* Since this was written it has been reported that it is probable the Hukuang Group will protest to the Chinese Government against the right given to France to build the Yunnanfu-Chungking line.

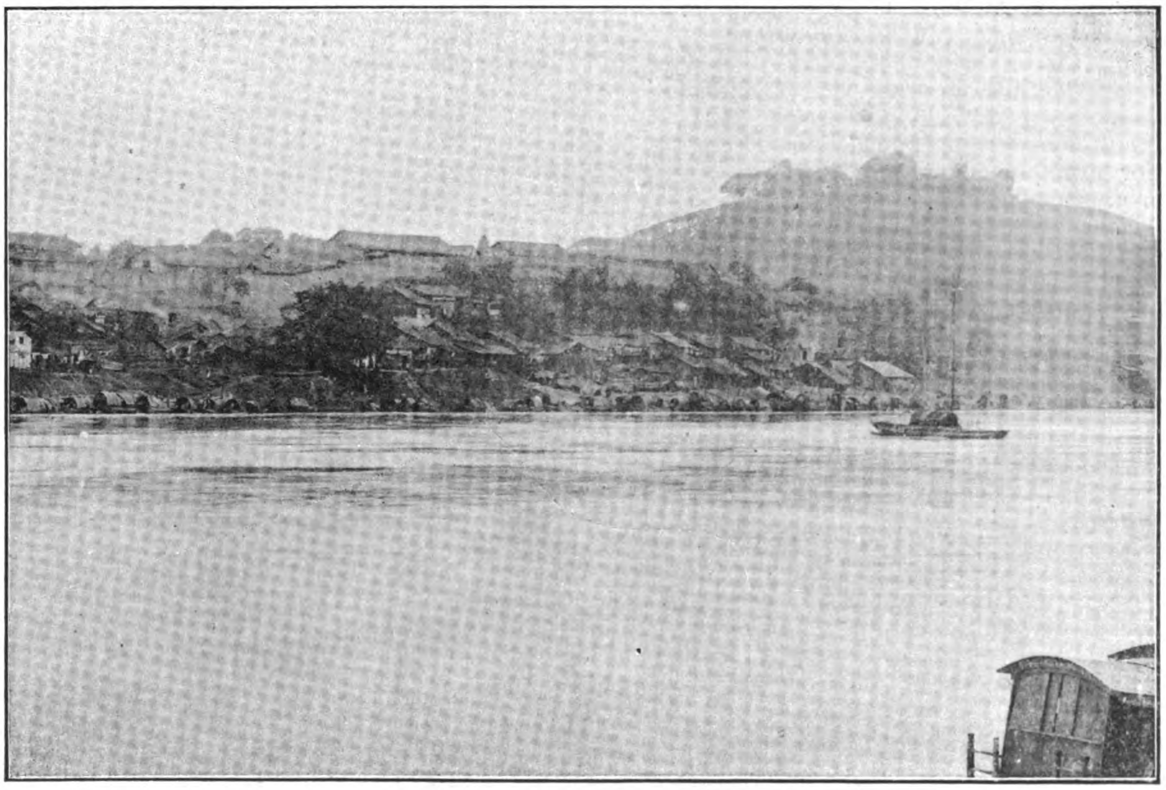


A part of Chungking, Szechuan

trunk-line-to-be, and the desire of the Government to have lines of communication with distant parts radiating from Hankow will no doubt dictate as rapid connection as possible being effected with the line into Kweichow province.

Of Hupeh cities Shasi (with a population of 96,000) ranks second in importance to Hankow, and its geographical situation in the centre of a vast system of canals and waterways connecting it with populous and fertile portions of West Hupeh and Hunan must secure it still a more important position in the future. That is the opinion of the Commissioner of Customs there. He reports that a careful computation of the trade of the port which does not pass through the Customs offices, exclusive of salt and opium, gives a healthy total of Taels 8,000,000. Its prospects of developing into a promising milling town are also exceedingly good since it is already noted as the headquarters of a considerable cotton trade, and has been long famous for its nankeens, in the production of which every hamlet and village in the district finds employment. The Commissioner declares that capital is to be found in the district, as well as the desire to invest it in anything spelling profit and progress, and he urges firms who propose to open on the Upper Yangtsze to study well the potentialities of Shasi before going farther afield. It may seem paradoxical, he adds, but were Shasi the terminus of large steamer traffic instead of Ichang, thus giving local exporters an equal chance of securing freight, it is conceded that the Customs revenue here would be twice, or treble, that now returned from the two ports. Shasi has, however, robbed the adjacent city of Kinchowfu of its one time importance. It was once the capital of a large province, and, under the late dynasty, the seat of a considerable Tartar garrison, but by the end of 1912 over 12,000 Manchu and an equal number of Chinese left the city, many going to Shasi and other less settled districts in the region. Though Kinchowfu will no doubt continue as a centre of an increasing nankeen, weaving, and silk trade, it is unlikely ever to attain its former prosperity. In 1912 the net value of foreign imports at Shasi was Taels 3,868,831, cotton yarn, cotton piece goods, sugar, indigo, dyes, and kerosene oil being the chief items. The Customs report for 1912 states that cotton piece goods increased heavily and must increase, while the demand for cotton yarns and indigo to supply the huge weaving industry carried on in the surrounding districts will also increase. Among exports raw cotton, raw silk, an enormous quantity of nankeen, vegetable tallow, beans, cereals, seed and seed cake, medicines, hides and fungus, figure chiefly. Bean and seed-cake mills are increasing in the interior, and paper of fair quality is exported by junk in increasing quantity. A flour mill with British engines and Japanese plant has been erected in the vicinity, and a large weaving factory with modern machinery is in course of completion.

The statement is made that Shasi nankeens are to be found in every village of Szechuan and Yunnan province, a trade which will surely develop immediately railway communication



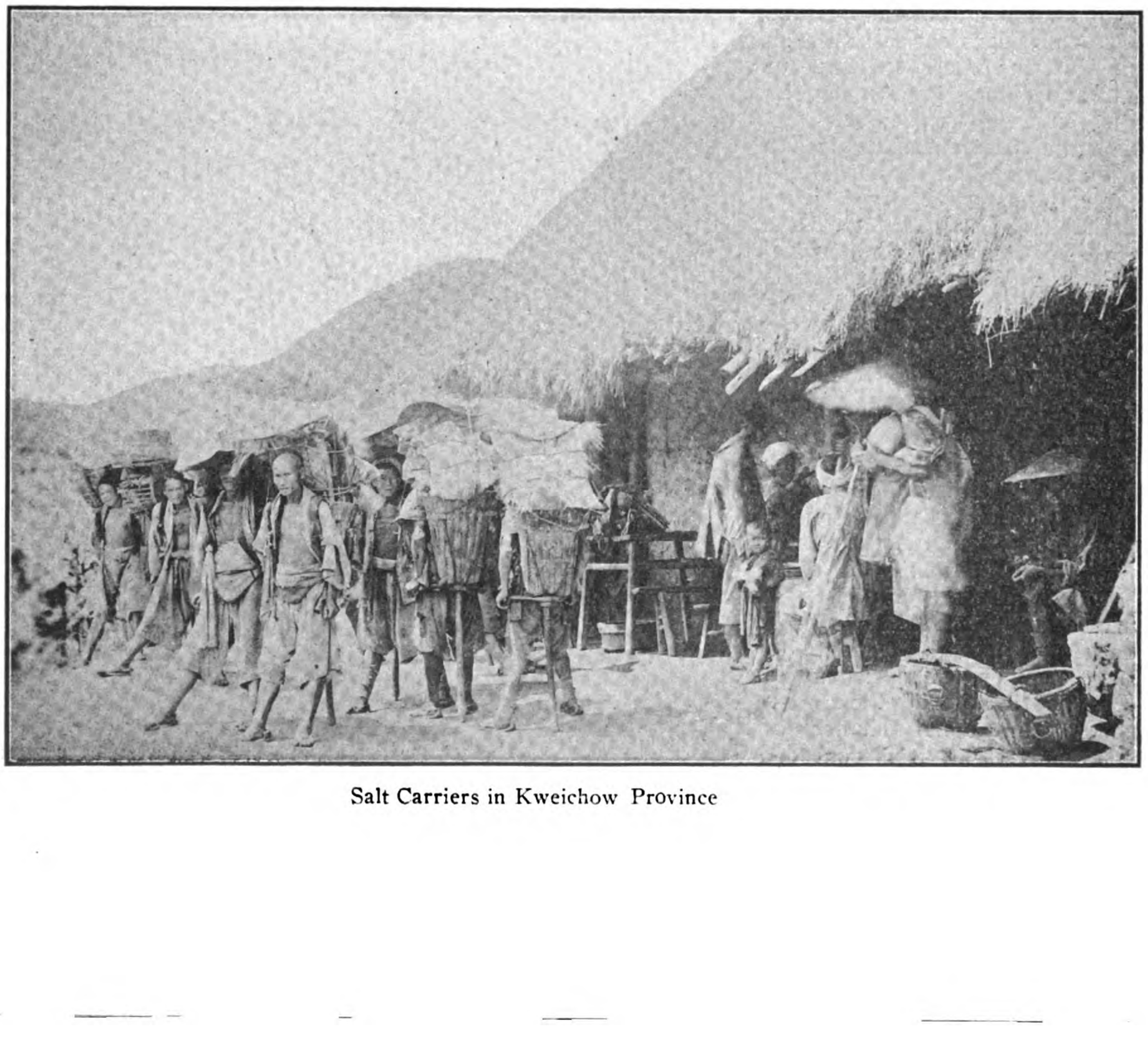
The Northern Suburb of Luchowfu, Szechuan, at high water Season

Map of Yunnanfu, Capital of Yunnan Province

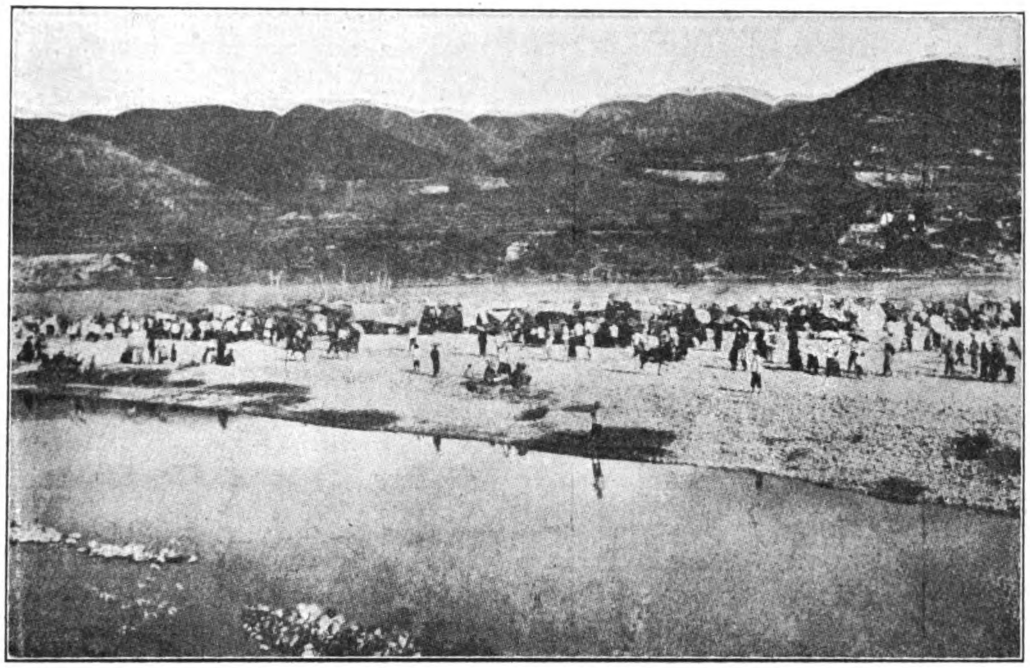
is opened to Kweichow province. It costs under present conditions at least seventy-five cents (or 1s. 6d.) to carry a 12lb. piece of grey shirting from Hankow to Kweichow, and Taels 18 to transport a bale of yarn, in each case 20% ad valorem. At present the trade flowing direct from Shasi into the southern hinterland is carried by junks across the Yangtsze and down the canal systems which dissect the country to Changsha. The main road, along which the proposed railway will no doubt run, if it is built,—for everything depends upon the survey now being carried out—goes south by west over low plains for twenty-five miles to Kungnan, when higher ground can be taken advantage of to Lichow, on the Ling river, a feeder of the Tung-ting Lake, thirty or forty miles to the east. At Changteh, on the Yuankiang, the road branches to Changsha, the capital of the province, the main route keeping south-westward along the Yuan river into Kweichow province. Changteh, by virtue of its position on the Yuan river and the highway to Kweichow and Yunnan is an important distributing centre, where a busy trade is carried on. Here all the junks start on their arduous journey up the rapids of the Yuan-kiang, and likewise the trade that is brought down is handled and sent off to Changsha or Hankow. The region thus far passed through and on to Changsha depends solely upon coolie transport. Wheeled vehicles are taboo—and the pack-horse is not tolerated. Man and merchandise are conveyed by coolies, the former in unwieldy chairs.

Changsha is about 110 miles from Yochow, on the Yangtsze, at the entrance to the Tunting Lake, and about 245 miles from Hankow by the river and lake. It enjoys the distinction of being one of the old famous cities of China, since the Taiping rebels were successfully resisted there. The population, estimated at 250,000, is decidedly conservative, but their city is regarded as one of the finest in China from the point of view of wealth of the people and size and character of the shops, the condition of the streets and public buildings. It is situated on the east of the Siang river, the perimeter of the walls—which are close to the river on the west side—being about five miles. The streets are stone-paved, clean, but narrow; the shops handsome and stocked with large assortments of goods. Gradually the people are losing the anti-foreign sentiments for which they were noted and the result is a steady advance in commerce.

The returns of the Customs Commissioners show a growth which is striking. The net value passing through the Customs in 1912 was Taels 22,038,368, an increase of Taels 4,348,000 over the figures for 1911, and more than double those of 1909. Yet the upward trend has only commenced. Imports absorbed Taels 3,301,000 of the increase, and export figures would have been some Taels 2,000,000 more had it not been for the restricted output of the Pingsiang Collieries owing to the temporary cessation of work at the Hanyang ironworks, near Hankow. The increase in foreign imports direct and coastwise, was contributed mainly by shirtings, jeans, cotton yarn, copper, (ingots and slabs,) bags of all kinds, arms and ammunition, indigo, kerosene oil, paper, machinery, refined sugar. Copper was imported for the mint, and the doubling of the value of dyes was due to the presence of foreign agents in the port. Chinese exports comprise two kinds (1) articles bought by foreign merchants for export abroad, such as ores, metals, beans, bristles, fresh eggs, feathers, hemp, hides, nutgalls, tea and wood oil, rape and sesamum seed, vegetable tallow and varnish; and (2) articles exported by Chinese firms for domestic consumption, as arsenic, bamboo shoots, black beans, coal and coke, preserved eggs, fire-crackers, grass cloth, lard (for use of Chinese in Straits Settlements), lotus-nuts, medicines, nankeens, 2nd quality paper, steel bars, tobacco, paper umbrellas; and articles bought by Chinese firms for sale to foreign merchants in other markets such as fire-crackers, human hair, hemp, black tea, and tea stalk. The



Salt Carriers in Kweichow Province



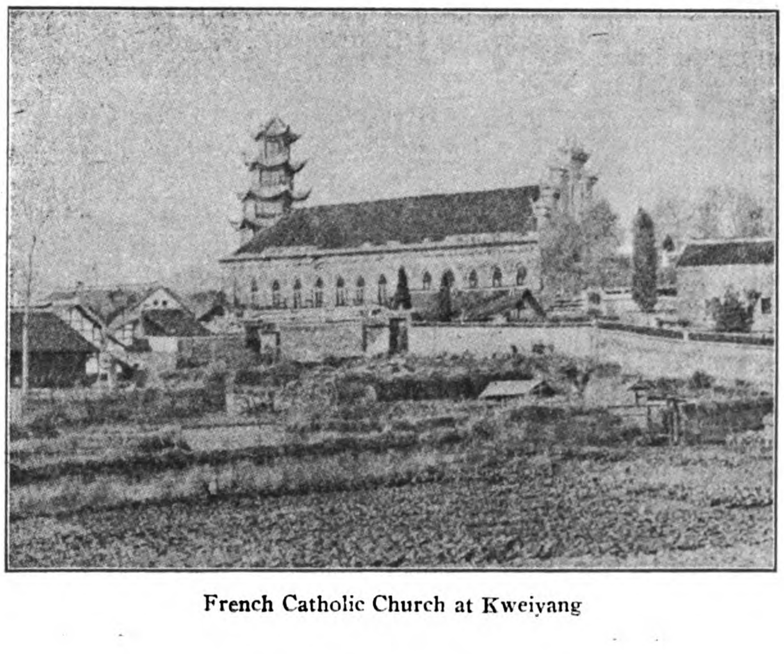
The River at Panghai—Kweichow

most notable increases shown in this trade in 1912 were by broad beans and wood oil, the former being shipped to England, Germany and Italy, where they are used for horse fodder. A considerable quantity of the crackers are said to find their way to America. Antimony is also exported largely though more regulus is being shipped than crude, the smelting fees thus being retained in the province. Hitherto the Huachang Smelting Company has had a monopoly of the manufacture of regulus, reports the Commissioner of Customs, and it has increased its capacity to about ten tons a day, and a further enlargement of the plant is contemplated. The establishment of two new smelting works in different parts of the province is contemplated, and is justified by the large deposits of ore. These deposits, probably larger than any other area of similar size in the world, when worked and refined, cannot have but a serious effect upon the antimony market. At the Shui Kou-shan mines zinc and lead ores are being produced to fill foreign orders, the mines, being the richest in the province. They were opened sixteen years ago and are solely under Chinese management, work being carried on under both western and Chinese methods. The mines are fully equipped with machinery and are connected with the river by about three miles of light railway. The ores are dressed at the mines, the zinc being mostly sold to the mint for about Taels 200 per ton. Lead is not produced, the smelting works which were established in the city being closed after a few months. The output for three months of 1912 is stated to be valued at Taels 5,000,000. With the exception of these mines there are probably no others working in the province according to modern methods, the main hindrance being want of capital. A great future is prophesied for tin, the metal exported being of excellent quality. The mines, however, are worked only by Chinese methods, and the pewter-ware for which the city is famous is made mostly from the product.

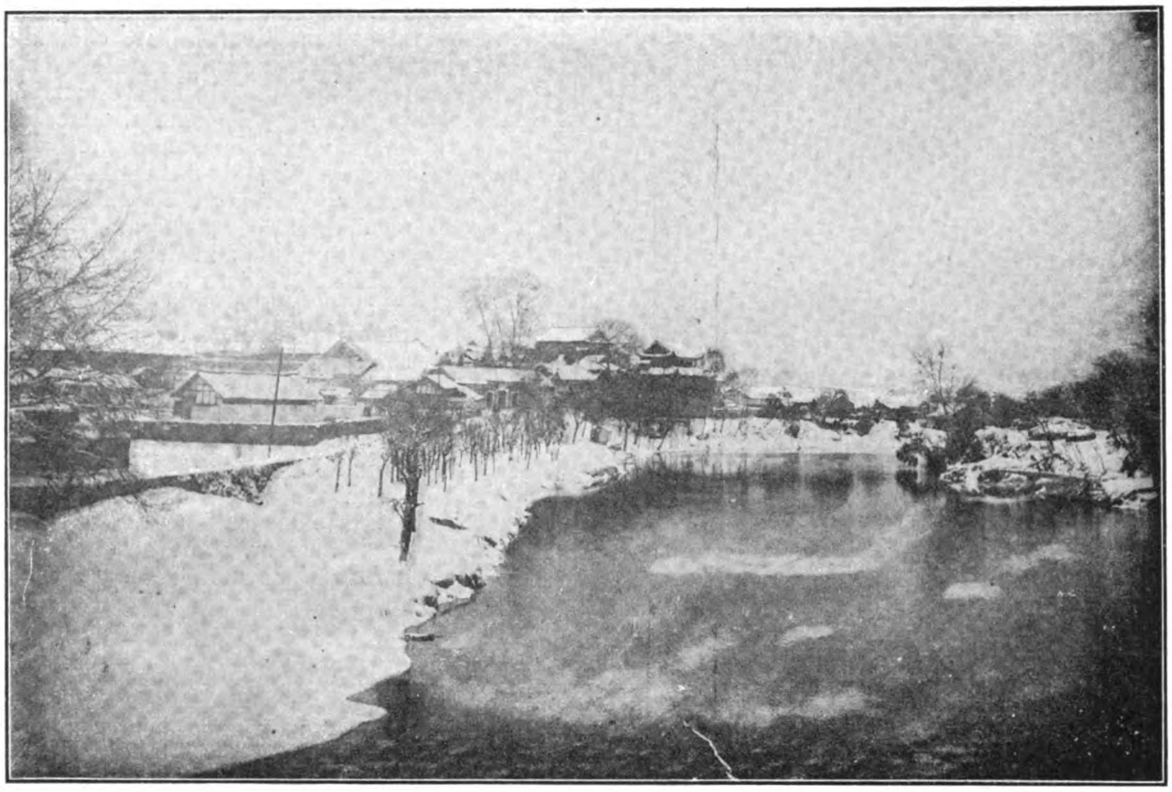
These few facts of the mineral possibilities under existing difficulties of communications indicate clearly enough what the future of the province would be if opened up by railways. Changsha is now dependent upon the waterways, which, however, give a service of immense value in developing the trade. During 1912 a total of 1,166 steam vessels, and 1,272 sailing vessels entered or cleared under "general regulations," while 6,040 entered and cleared under "inland steam navigation rules." The city is, however, destined to increase in importance by virtue of railway connections, for in addition to the line which will pass through it from Peking to Canton, and the one likely to be built from Shasi and Changteh, there is also one projected from Nanking, through Nanchang, the capital of Kiangsi, to Pingsiang, the line from which place already exists and brings coal from the mines that are working there.

From Changteh the road to Kweichow follows the Yuan River valley, climbing past gorges of utmost picturesqueness, and traversing undulations which give marvellous views of rugged scenery, temples perched on craggy points, and the wild river roaring over rapids beneath—rapids which, however, deter not the toiling junkmen who pull their boats upstream, twenty to thirty men to a junk, in defiance of all natural obstacles. And so to Shenchowfu (455 feet above the sea) and to Yuanchow, —the point of junction of the roads from Canton, from the south-east of the province, and from the north-west—and on to Chenyuan, the head of navigation. Just before reaching this city a bridge of five or six arches spans the stream, and, combined with the rocky heights which surround the town, lends to the scene a distinct air of grandeur. The gorge passed through before Chenyuan opens to view is one of the most picturesque, as well as most difficult, on the river. To Shihping the road is ill-paved, marked by steep inclines and precipitous paths, though beyond Hsinchow it follows a high level, the valleys below being cultivated by rice farmers. Coal is frequently outcropping, and evidences of iron abound. The depopulated nature of the province is responsible for fertile and beautiful valleys through which the road passes being practically deserted, though, as the capital is approached, the cities grow in size and the country is more cultivated. From Kweiting onwards the road traverses narrow ravines, with trees such as willows, oak, horse chestnut, ashes, and sycamores covering the lower slopes of the hills. Wild flowers grow in abundance and what the late Mr. Margary describes as "a paradise of ferns" is passed through. The last pass before Kweiyang is reached permits of a magnificent view and the city as it rests 3,527 feet above the sea on the uneven plain below. It is surrounded by high hills, many of which attain remarkable shapes and stand solitary in the plain. Viewed from the distance, with a wealth of green trees, suggestive of coolness and shade, the city looks inviting, but the traveller upon entrance finds it much as other cities in China—crumbling in the hands of time. Memorial arches of all shapes and sizes wrought out of white marble crowd the road to the city, and give eternal renown to pious maidens or stedfast widows.

The city is comparatively large and busy, the main thoroughfare running from the north to the south gate, and containing commodious and lofty shops offering a large variety of goods for sale. In the piece goods shops are to be found a large assortment of foreign and native cotton piece goods and plain and brocaded



French Catholic Church at Kweiyang



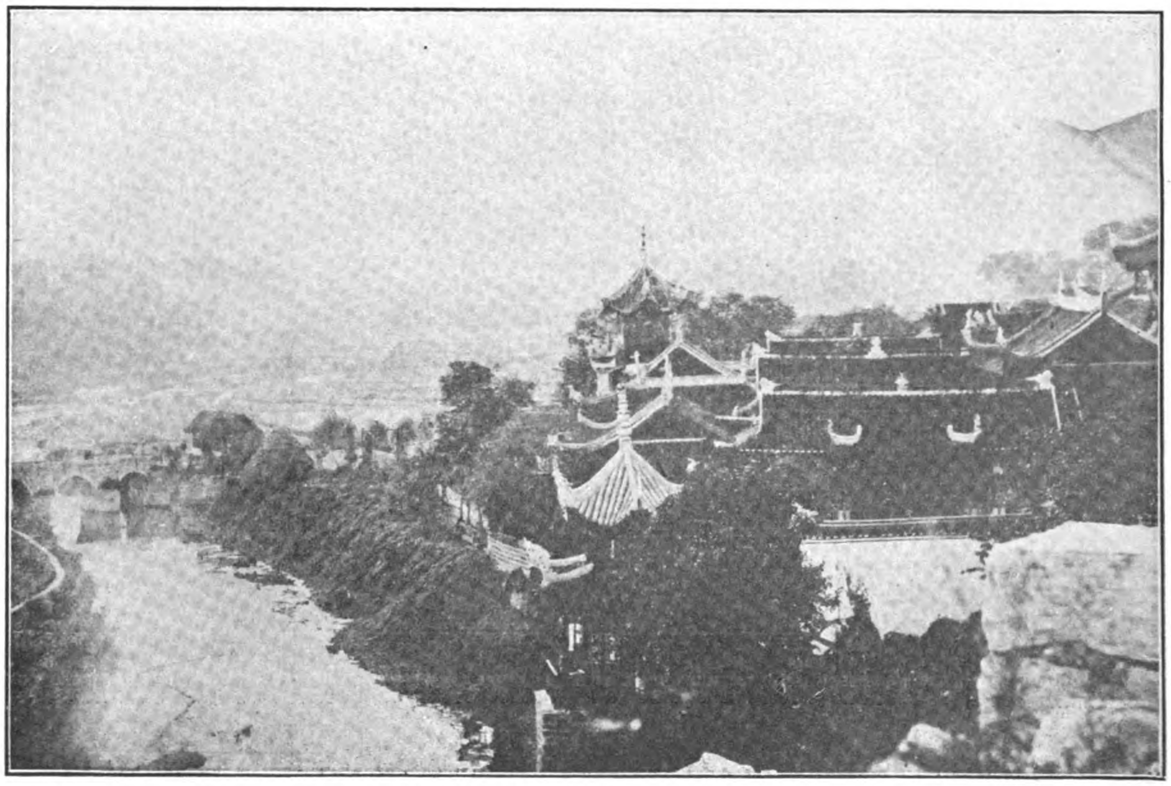
Winter scene at Kweiyangfu, Kweichow

silks. The Blackburn Mission reported that "trade generally was in a prosperous condition and the people prosperous, though enterprise was restricted owing to lack of capital."

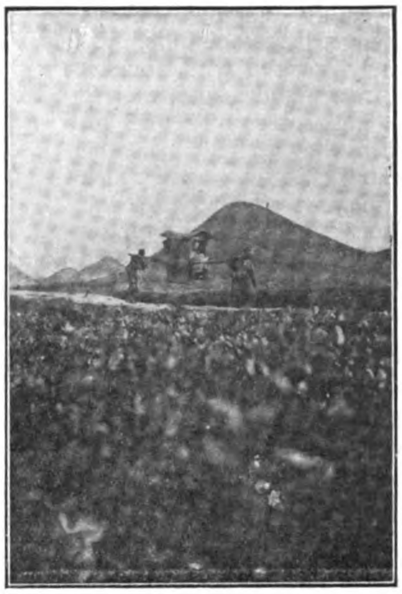
Coal is the fuel burned in the city the main supply coming from mines ten miles away to the west. Immediately outside of the city the road continues through cultivated tracts and through large areas of arable land unoccupied, but which, in former times, was intensely cultivated. The road ultimately winds among low hills of strange formation, passing a remarkable avenue of hills extending in a straight line north and paved for several miles with a perfectly flat and narrow strip of land between. There is, says Mr. Margary, a regular conclave of huge tumuli, which do not exceed 300 feet in height, in this region, the road threading its way between them to fine valleys which throw out long arms like estuaries. Grass covered plains are the feeding grounds for herds of tame buffaloes owned by the Maiotze tribes people, who live in the villages or on the hills.

Sixty-five miles from Kweiyangfu stands the walled city of Ashunfu, which is approached over undulating downy ground, and through a graveyard extending over two or three thousand acres on the east side of the city walls. Though small in size and population it is the centre of a prosperous trade, and is the second most important city in the province. The main street is well paved, and ornamented with memorial arches. Large shops contain ample and varied stocks of goods and merchandise, and there is an enormous and ever increasing demand for foreign yarn, the value annually imported greatly exceeding that of all other imports taken together. The weaving industry is a large and profitable one. The city is also the province's centre for the white wax insect, bags and baskets containing the pupæ of the insect being offered for sale.

The road goes westward through increasing cultivation, the valleys being broad and of rich soil. Mr. Margary writes at this stage, "one thinks Kweichow an impenetrable mass of mountains, but it was most remarkable to find it possessed of many fine plains lying in the right direction." Five miles from Chenning the broad valley ends and a smaller one is entered over an easy pass, and extends for about three miles when the road again runs sinuously between grass covered hills, soon to meet with a rocky mountain barrier. Near Hwangkwe, the river leaps over a precipice 140 feet high, and beyond the road ascends and descends, "but even in the midst of this mountain mass, where the rocky cones were tossed and tumbled like a stormy sea, there was a succession of quiet valleys down below lying flat at the bases of these abrupt boundaries" Near here the road to Shingyi leaves the main route to Yunnan and enters difficult country. A deep cleft is crossed, with more ascents, and the road descends into a canyon of desperate appearance by a precipitous path. The turbulent river rushes between high vertical precipices which almost shut out the light till it disappears into what looks like "the dark entrance to the nether world," as the report of the Blackburn Mission puts it. A stiff climb of 2,400 feet then takes place, and within a few miles a similar descent is made with a gradual rise to Taipingkai. From here on to Shingyi (or Wang-tsca-pa as it used to be called) the country is more conducive to ease and comfort, the route

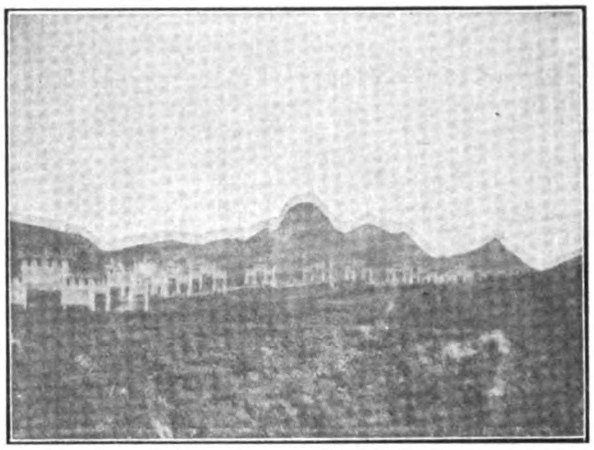


Outside the West Gate of Kweiyangfu, Kweichow. The Shanyuan Temple, and road towards Anshunfu



Transport in Kweichow Province: on the Kweiyang Road

Miao Women Porters, Kweichow



The Approach to Kweiyangfu, Kweichow

A Salt Market in a Kweichow Town

traversing narrow valleys amongst limestone hills, profusely covered with flowers, shrubs, and particularly radiant roses. This is on what the natives call the yellow grass plateau, of which Shingyi is the market town. The valley in which Shingyi is situated is well irrigated and boasts of an enterprising population, who devote untiring energy to cultivation and irrigation.

Shingyi is remarkable for the large quantity of Indian yarn that is imported annually, and the quantity of cloth which is produced in the town and neighborhood from the yarn. It is estimated that from 1,000 bales of 400 lbs. are sold every year and that from 2,000 to 3,000 looms are engaged in weaving various grades of narrow cloths from this yarn and native cotton. The greater part of the yarn is bought in Hongkong and shipped by way of the West River through Poseh, from which place it is carried on pack animals, taking twelve stages of an average of 30 miles a stage, to accomplish the journey. Shingyi is the objective of the railway from the Yangtsze, and at this point it is expected that the line which has been allotted to the Banque Industrielle de Chine to build from Yamchow, on the coast, to Yunnanfu and beyond, will pass, and so permit of a junction which will give access to Yunnanfu to passengers and freight travelling from the Yangtsze regions or from Kweichow province.

Kweiyang, Capital of Kweichow.

Mr. F. S. A. Bourne, in his report of the Blackburn Mission, says of Kweichow that it is "richer in agriculture, and I believe in minerals also, than eastern Yunnan. The bedrock is almost everywhere limestone, making beautiful scenery and a healthy climate; there is little or no malaria. The altitude gradually sinks from 5,000 feet in the west to 1,500 feet on the eastern side of the province—the Hunan border. It is not as badly cut up by water as Yunnan, where every stream has made itself a deep canyon, but consists for the greater part of narrow valleys between limestone hills, a stream running down the bottom, perhaps a little terrace cultivation near the stream, but the hillsides given up to ferns and flowering shrubs, which grow in the greatest luxuriance, or, if the valley is some way from a town, covered with trees, not heavy timber, but fire, bamboos and fruit trees; pheasants are calling and water splashing—an earthly paradise. To this natural beauty the works of man present a melancholy contrast."

[**Note.**—The latest information suggests that the American section of the Hukuang Lines beyond Ichang will be extremely difficult and costly and will take many years to build. Until the American section is built the line from the Peking-Hankow Railway to Ichang would be of no service in tapping the trade of Szechuan, the main justification for its construction. In any case the branch line to Siangyang would be built and, as stated elsewhere, Herr Linow, the Engineer-in-chief of the German section has recommended that it should be undertaken first. Some doubt has been expressed as to whether the American section will ever be built, as the French line from Chungking to the Gulf of Tonkin, if built, would attract the trade. It is calculated that the British and American sections of the Hukuang lines will cost about £8,000,000 each, while full amount of the Hukuang Loan is only £10,000,000.]

ARCHITECTURE IN THE CHINESE CAPITAL

The Supreme Court of Justice

The Taliyuan, or Supreme Court of Justice, which was recently opened for public business forms another important addition to the few existing government buildings in Peking designed in foreign style. Situated in the Hsin Pu Chi Street in the Western Quarter of the Tartar City, the building is of some considerable extent, having a frontage to Hsin Pu Chi Street of 450 feet, and a depth of approximately 150 feet. Being four storeys in height, it stands out prominently from the immediate surroundings.

The building is designed in a free treatment of the English Renaissance style of architecture, and being set back close on 150 feet from the roadway, it has a decidedly handsome and attractive appearance.

The façade to the street has a rusticated ground floor storey, and two floors above marked by an Ionic colonnade, the whole being crowned by a balustraded parapet. The central feature of the façade is the clock tower, which rises to a height of 110 feet, while at either end of the front there are smaller towers rising to a height of 90 feet. Each of these towers has a dome top, which is covered with copper. The building throughout is built of local made brick, the whole frontage, and the return faces of the corner towers being finished off in cement plaster, while the remainder of the elevations is faced with blue bricks having bands of red brickwork at the sill and lintel courses as well as in the pilasters. The roofs are covered with red tiles also of local make. In the centre of the building are two large courtyards, each measuring 155 feet by 55 feet, thus ensuring plenty of light and ventilation throughout all the rooms in the building.

Access will be obtained from the roadway through two handsome wrought iron gateways, set back some distance from the front boundary, and on either side of the forecourts to same, there will be erected two small gate lodges.

The principal entrance to the building is in the centre of the façade under the clock tower, while there are also other entrances in the front

elevation to the right and left of the main entrance, as well as on the side and back elevations, all of which give easy and immediate access to any part of the building. Entering under the clock tower and passing through a vestibule and outer hall, the main entrance opens out into a fine staircase hall, out of which rise the two principal staircases giving access to the upper floors.

The accommodation on the ground floor, on the South side of the building, comprises two large criminal courts, each having in suite judges' rooms, consulting rooms, retiring rooms, and numerous rooms for witnesses and servants. On the North side are two large civil courts with accommodation similar to that for the criminal courts. In addition there is accommodation provided for the law library, secretaries' offices, retiring rooms, enquiry offices, despatch rooms, attorneys' rooms, reporters' rooms, reception rooms, telephone rooms and servants' rooms, while there is ample lavatory accommodation.

On the first floor the principal apartment is the Supreme Court, adjacent to which are suites of rooms for the Chief Justice, the Attorney General, the Judges, the Chief of the Court, and their respective secretaries. On this floor also, there is a large civil court, a general meeting hall and reception room, rooms for the secretaries, a large reading room, and numerous retiring rooms, as well as rooms for witnesses and servants, and ample lavatory accommodation.

On the second floor, there are fifteen suites of three large rooms each, forming offices for the various branches of the courts work.

In the basement, accommodation will be provided for the heating plant, electrical plant, kitchens, servants, etc., and in addition there is large storage space. In the upper part of the central tower provision is made for a clock, with 8 feet diameter dials facing all four ways, and a large bell, both of which should be of great service to the inhabitants of the Western quarter of Peking.

The whole of the sanitary fittings, and the plumbing and drainage work will be carried out in accordance with the latest improvements in sanitary science, the septic tank system being installed for the treatment of the sewage.

The buildings throughout are heated by steam on the low pressure system, with radiators in the principal rooms and corridors, while an electric light and electric bell installation and a telephone system have also been installed.

Messrs. A. H. Jaques and Coy., Builders and Contractors, of Tientsin and Peking, are the general contractors for the whole of the works on the building, which has been designed and erected under the superintendence of Messrs. Atkinson and Dallas Ld., Civil Engineers and Architects, 4 Legation Street, Peking.

The Taliyuan, or Supreme Court of Justice at Peking

THE CHINA MERCHANTS COMPANY

The China Merchants, Steam Navigation Company recently decided upon an increase of capital. Originally the company's capital was Tls. 2,000,000, and some years ago this was increased to Tls. 4,000,000. The latest proposal, however, was to increase the capital to no less a sum than Tls. 16,000,000, and to pass this proposal a meeting of shareholders was held. Mr. Wong Tse-chin, Chairman of the Board of Directors, presided, and submitted a report on the proposed resolution. In the course of his remarks he stated that since the revolution of 1911 many comments had been made in regard to the working of the company, and a suggestion had been made to wind it up. That this was not desirable was evident from the fact that the company's working had been quite successful, and a recent valuation showed that the company's assets were worth something like Tls. 16,000,000 as compared with its capital of a quarter that amount.

Mr. Shen Tun-ho spoke in support of the recent valuation and a resolution was ultimately adopted for an increase of capital to the amount stated. This will necessitate a further increase of shares, but no additional money will be required.

ELECTRIC LIGHTING IN MANCHURIA

The South Manchuria Railway maintains electric lighting plants at Dairen, Mukden, Changchun, Antung, and Liaoyang, and holds a controlling interest in the lighting plant at Newchwang, which is operated in connection with the waterworks establishment at that port. All of these institutions seem to be giving fair business returns. Supplementary equipment, increasing the capacity by 1,500 kilowatts, has recently been added to the Dairen plant. The capacity of the lighting establishments at Antung and Changchun is also being increased, and an additional generator will be installed at the Liaoyang plant in the near future. The construction of an electric tramway and the enlargement of the railway lighting plant at Mukden are under discussion, but negotiations with the Chinese authorities have made little headway.

Recent statistics of lighting plants located at main points along the railway give the number of households in which current has been installed as follows: Dairen, 6,600; Mukden, 1,200; Changchun, 1,200; and Antung, 1,250. Meters are installed only where five or more lamps are in use and the figures show that 32,000 lamps are supplied by meter in Dairen, 2,300 at Mukden, 3,400 at Changchun, and 2,600 at Antung. Lamps supplied by monthly contract number 16,000 at Dairen 4,500 at Mukden, 3,800 at Changchun, and 3,600 at Antung.

LUMBER IN THE PHILIPPINES

The hardwood lumber industry in the Philippines will receive a new stimulus when the riches of the Caramuan peninsula will be put on the market after the contemplated exploration and survey has been completed, says the Manila *Daily Bulletin* of February 5, and continues:—

A survey and exploration party will be sent at the end of this month to commence work on Caramuan peninsula, one of the most heavily timbered sections of the islands and will report the exact conditions to the bureau of forestry.

The peninsula, which is situated between San Miguel bay and Lagonoy gulf, has great harbor facilities; two good harbors are known at present. The geodetic survey will cooperate with the party in locating all additional ports which can be made available for lumber shipping.

Several inquires by lumberman have already been made about the section in question and as soon as the respective data is compiled bids for the forest products will be asked for.

JAPAN STEEL WORKS

Mr. Takasaki, ex-Governor of Osaka, has assumed the presidency of the Japan steel works as a result of mutual arrangement among directors, and is introducing innovations into the business proceedings of the works. In this context he is represented to have said that the losses sustained by the works since their inauguration have amounted to more than 600,000 *yen*. The first duty to be filled by the new directorate is to place the concern on a much more workable basis and make the business a paying one. That the object may be attained the proceedings in the works must be made more businesslike and operations must be conducted on a much more extended scale. At the same time the running expenses must be reduced as much as possible. As a first step towards this end, three high-salaried officials, whose duty it was to superintend the general management of the concern, were relieved of office, and other measures of reform are soon to follow.

The public regard the prospects for the works with anything but glowing hopes, believing that the works have suffered and will continue to suffer from the competition of Messrs. Armstrong and Vickers and the hostile attitude of the Mitsui Bussan Kaisha, the agent in Japan for the British concern. The new president of the works refuses to acknowledge the existence of these disadvantages, declaring that the idea of those foreign and domestic companies interfering with the business of the works was only ridiculous, considering those concerns are the actual proprietors of the works. He, however, recognizes the fact that the only preventive against the much-feared competition is the difference existing between the ability and efficiency of British workmen and those of Japanese and the geographical positions of the respective works.

Though the works at Muroran have been planned on a large scale still, in the opinion of the new officials, their accommodations are very defective and that is at least one of the chief reasons for the unsatisfactory results having so far attended the business. Therefore it is proposed that as soon as the resources grow sufficient to stand it the extension of the works should be effected.

THE ARC WELDING PROCESS

The art of welding metals is one which has undergone considerable revolution in recent years, there being, as is well known, several processes at the disposal of Engineers, Boiler Makers, Ship Builders, and others to-day.

The system which appears to be making the most headway just now, is, it can hardly be denied, that of Welding by the Electric Arc.

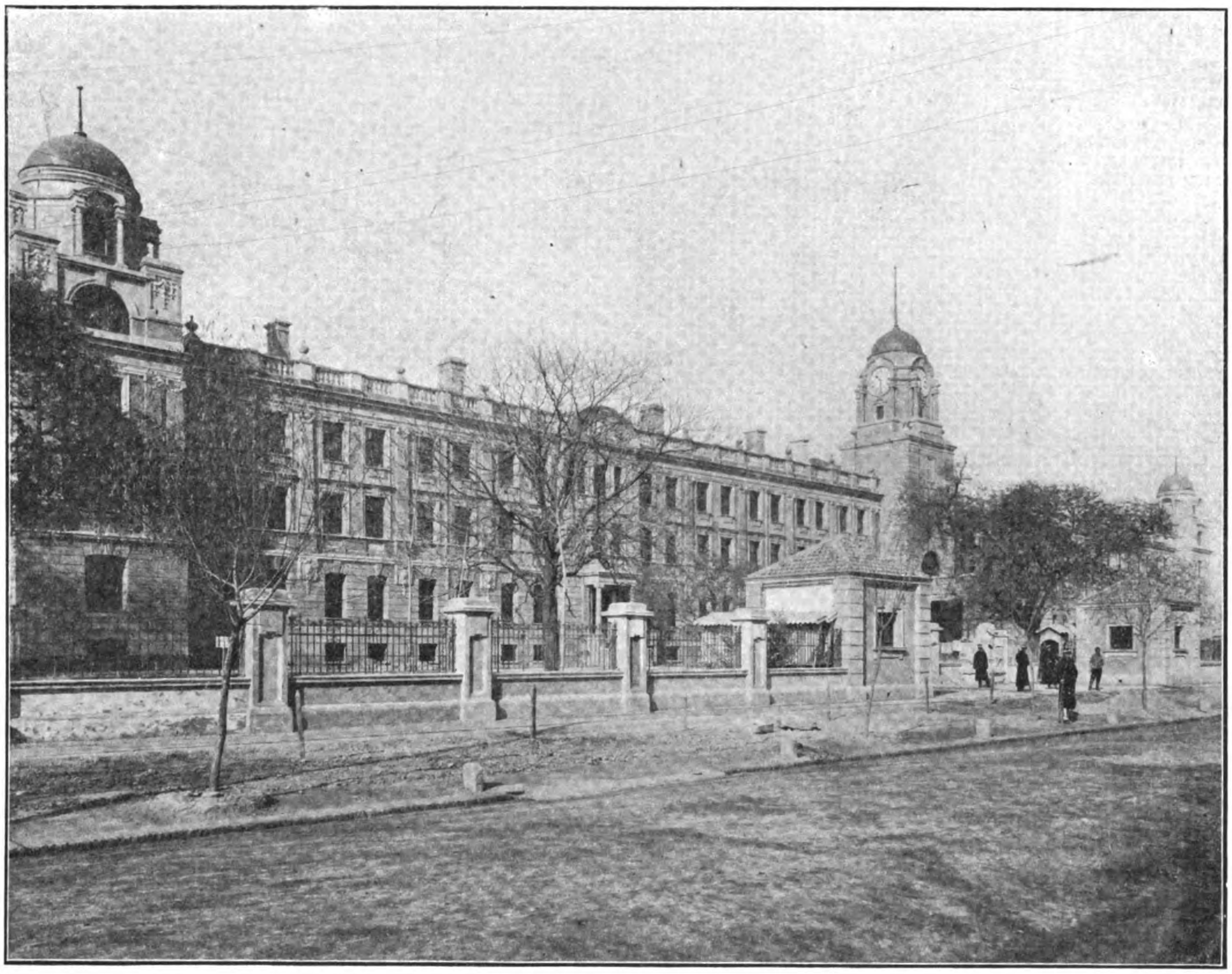
Like so many other changes in a particular art of industry, the arc welding process has introduced a considerable demand for a special engine and dynamo. The introduction of a Welding Plant compels attention to the essentials for success, namely, close governing, efficient cooling, full power running qualities, perfect vapourisation of paraffin, and so on in the engine, together with a dynamo which is specially wound for the sudden fluctuations.

It is a case of either full load or no load instantly with such a plant as this, and one of the firms who have been most successful with their engines for this work is the Parsons Motor Coy., Ltd., of Southampton, who we understand have just booked orders for no less than five more of their engines for this work.

They have already nearly a dozen firms using their engines most successfuly, and seeing the care and attention with which they have devoted themselves to the problems connected with this development, they appear to have fully merited the orders going to them.

Mr. Fank L. Crone, Director of Education in the Philippines, has resigned.

Professor Goodnow, Adviser on Constitutional Law, has accepted the Presidency of the Johns Hopkins University, and has been permitted to curtail his engagement with the Chinese Government.



Another View of the Supreme Court of Justice at Peking

THE OIL FIELDS OF NORTH CHINA

CHINESE GOVERNMENT AND STANDARD OIL COMPANY COMBINE FOR EXPLOITATION

For months past rumours have been rife in regard to "deals" giving foreign interests the right to expioit the oil fields of Shensi and Chihli. Of these the most important in Shensi are in the Yenchang and surrounding districts. The total oil-producing area in the province is said to be 2,100 square li, and the oil from the Yenchang district is of the best quality. In Chihli the oil fields are in the district of Chienchang. At one time it was said that in consideration of a loan or payment running into high figures—$70,000,000 was mentioned—the Standard Oil Company was to obtain a concession to operate these fields. At another it was said that the interests, represented by the Rising Sun Oil Company, had, in the words of the *China Tribune*, a well informed Japanese paper published at Tientsin, given "a warning to the Chinese Government and tried with all its might to nullify the acquired rights of its rival concern (the Standard Oil Company). The efforts of the Rising Sun Company proving quite successful, the Chinese Government is considering to work the extensive oil field in co-operation with it. It is said that a battle of concessions is merrily going on between the three parties concerned." This was written in September, 1913, and, no doubt, represented the position as it then existed with sufficient accuracy. But the Rising Sun Company did not sweep the "rival concern" out of its path, and it was later reported that the Sino-Japanese Corporation originally started by Dr. Sun Yat-sen and others, would obtain the concession. Colour was lent to this report by the visit of one of the prominent officials of the Corporation to Peking. However, this report also proved to be based upon an unsubstantial foundation, and it was not until February 13 that any really definite news about the future of these highly prized and valuable oil fields became available. It was then announced that an agreement had been reached between the Standard Oil Company and the Chinese Government for the exploitation of the Shensi and other North China oil fields by a Sino-American Company. In this concern the Standard Oil Company was to hold at least 55 per cent. of the shares, thus securing a controlling interest. The information made available at first was rather meagre. For reasons which no doubt were deemed to be quite sufficient, the Government thought it unnecessary to make public the exact nature of the arrangement that had been made. It was inevitable that some opposition would be presented to any scheme to develop China's oil resources—it is always possible, unhappily, in China, for an agitation to be worked up against any proposed foreign co-operation in the development of the country's mineral resources. This secrecy enjoined by the Chinese Government was ill advised, as an agitation, mainly based upon ignorance of the real nature of the Agreement, began to assume serious proportions. It was then deemed advisable to publish the terms in order to make it clear that in this instance China had made a remarkably good bargain.

It is stated in the Agreement that the interest in the Sino-American Company to be given to the Chinese Government will be 37.5 per cent. of the share capital, with the option for two years, of taking up another 7.5 per cent. There is a proviso that the formation of the Sino-American Company is dependent upon proof being obtained that the oil fields are of sufficient value to be worth exploiting, and it is understood that a staff of experts is now *en route* from America to settle this point. The Chinese Government is also to receive a royalty of 1.5 per cent. The Sino-American Company, if formed, will have the exclusive right to work the oilfields for sixty years, and no other concession of oilfields in China is to be made to other persons for one year. One-twentieth of the total output is to go to the Chinese Government free of cost.

That the Shensi oil fields are of enormous value is almost beyond question, though little data is available. The well known experts Professor Engler and Hoeffer in a report published in 1911 said:

"On the South of the desert Gobi, at the base of the Nanchang Mountains in the province of Kansuh, at a distance of 20 miles from Schangte-King-pou, near the River Tsche King-sia, are situated petroleum rocks. About a dozen wells, 3 ft. deep, are separated by an enclosure. Four families, descendants of the discoverers of the bearing, have the authorisation of collecting the oil, which daily accumulates on the surface of the water. Out of the total quantity of petroleum they have to pay the State 500 gallons, and contribute to the illumination of the pagodas 100 gallons a day, and the rest is their exclusive property. The oil is used as lubricating oil, or, after it has been submitted to a summary cleaning, as an illuminant. In the province of Shensi, at a distance of about 100 miles to the south-west from the missionary station Hsiaotschao and the town of Ning-taio-liang, petroleum rocks are situated in a mountainous district. Rivulets of petroleum are there, descending from great heights from red rocks and sands. The oil is of a greenish colour and very fluid, and is used, as an illuminant. In the yellow tertiary layer, 104 to 300 ft. deep, the honggay (reed) sand, the qua-hong-gay (grey) limestone, the honag-kiang-gay (orange) onthic iron, then the bituminous strata at a depth of 600 ft., then the fsao-pe-gay (white salt); then at a depth of 810 ft. the gas strata; then, again, tsin-tsche gay (grey blush) strata, forming marls; and finally, the petsch-gay (white) strata, corresponding to the permien limestone. At this depth of 990 to 1,800 ft. there is salt water in yellow layers, then mey-tau-gay, limestone and coal, the ma-kou-gay (brilliant green), corresponding to silurians, the he-you-gay (Cambrien). Below 2,790 ft. there are salt waters and large quantities of gas. Most of the borings at Tse-lin-tsin are at this depth. Petroleum is found sometimes before reaching the marl and shale formations, the salt water before reaching the coal. The gas is found above coal, the richest parts being in the passing strata; coming from this level it burns with a blue or yellow flame, and when found above the level with white flame. It often comes out under very high pressure, and with tremendous explosions. The crude oil is of various colours; the best is nearly water white, and is used exclusively as an illuminant for lamps. The yellowish and greenish oils are as well used for illuminating, while the black viscous oil as lubricant. The Chinese do not refine their petroleum, but sell it on the spot at prices varying from f.0.33 to f.0.41 per kilo. The number of petroleum sources in the district is from 30 to 40, and in the whole province about 50. In the district of Pen-Tsi-hsien (province Tung Chuan-Fu) there is a company formed for the purpose of petroleum exploitation. The oil obtained by the company is heavy and cannot be used for illuminating purposes without being refined. L. de Loezil, an explorer of China reports that oil of excellent quality is found at Futschau-fu, on the River Min-ho. The district Min-ho shows all the signs of being rich in petroleum."

Earlier in the same year Mr. J. H. Arnold, United States Consul at Amoy, in a report on petroleum in China said:—

"The supply is said to be inexhaustible. The refined oil is transported over rough cart roads 200 miles to Sianfu, where it is sold in open market for the equivalent of 30 cents United States currency a gallon, competing with foreign kerosene, which sells for 43 cents a gallon. The larger cities throughout Central Shensi are being supplied with the products of the wells of Northern Shensi. The company is considering the construction of a light railway from Yenchang to Sianfu, as transportation by cart costs them at least 5 cents United States gold per ton-mile."

Another report, issued in 1908, said:—

"There is no reason to doubt that the reports of valuable oil measures in the western parts of China are not founded on a very solid substratum of fact. The Trans-Caucasian oilfield belongs to a large region, geologically homogeneous, extending from the Crimea, in the northwest along both sides of the Caucasus and along the northern frontier of Persia to Merv and Sarakhs in the south-east, a region in which petroleum is known to exist at many points and there appears to be no reason why this oil area should not, like the geological area, extend into the confines of Chinese Turkestan and to the Provinces of Kansuh and Shensi. Similar argument might with justice be applied to the province of Szechuan and to some parts of Yunnan. The oilfields of Burma are famous, and before the discovery of the oil areas of the United States afforded no considerable share of the world's supply. The geological structure of Burma and the provinces of Szechuan and Yunnan are very similar, and in some senses continuous, so that the probability of abundant oil bearing areas in these provinces is very high. The presumption is thus is thus in favour of the possibility of extensive oil resources in China, and the economic changes which the realization of this possibility would bring about are enormous. With the exception of the American boycott period the importation of kerosene oil has during the last four years been slightly above or slightly below 160,000,000 gallons, with a value of from nineteen to twenty-seven million Haikuan Taels. The bulk of this import was from the United States, and of the remainder the Dutch India and the European Ports of Russia supplied about equal portions.

The exploitation of China's mineral oil wealth would make rapid inroads upon this trade. The cheapness of Chinese labour would enable an oil bearing district properly equipped with modern appliances to undersell both the Russian and the American producers. The great difficulty lying in the way of the Chinese trade would be that of transportation. For tank movements the necessary railway accommodation is not yet provided; nor is it likely that an enterprise in its initial stages would be able to carry out pipe line distribution on any large scale, even if the number of local official bodies with powers to hamper and restrict such an enterprise were much smaller than at present it is. The initial transportation difficulty once overcome would open the way to an enormous trade. The use of kerosene is by this time well-nigh universal in China and China herself would be the first consumer of her own products. Facilities for transportation from Chinese Turkestan westward are increasing yearly, under Russian auspices, and the possibility of rivalry between the Chinese product and the product of the adjoining Russian fields suggests itself."

There have been spasmodic efforts on the part of the Chinese to arrange to work the Shensi fields on a large scale themselves. In October, 1908, H.E. En Shou, the Governor of Shensi recommended to the Throne that in view of the discovery of rich deposits in the district of Yenchang in that province, the Government should obtain an interest in them by advancing a portion of the Capital needed by the merchants and people who were in possession of the land containing the petroleum. An Imperial Rescript was issued authorizing the Ministry of Posts and Communications to advance the sum of Tls 2,000,000 to the oil company then being organized to exploit the wells. In consideration of the advance it was to be the privilege of the Ministry in question to appoint the principal officers of the new Company.

The matter was dropped and in 1910 it was announced that a company had been formed with a capital of six million Kuping taels to work the fields. Like so many similar undertakings this company does not appear to have emerged far from the phase of discussion, and the fields are still worked in a most primitive manner. Some of the Chinese companies operating engaged Japanese experts to supervise the work, and this is apparently the ground upon which the Japanese claim to a concession is built.

Other considerations apart it will undoubtedly be an excellent thing if a start be made to develop China's oil resources. The actual monetary return from the shares in the operating Company will be the least part of the advantage China will gain. The establishment of a huge industry, giving employment to thousands will mean the circulation of a large sum of money and will enormously benefit Shensi in particular and China in general The Chinese Government gets 37½ per cent. of the stock and subsequent profits for nothing, and can purchase another 7½ per cent, thus securing an interest amounting to 45 per cent. The invaluable advantage is gained of having fields developed by the largest concern of its kind in the world, whose experience, organisation and equipment are made available free of cost. China, if the expression be pardoned, is in a "heads I win tails you lose" position. If the oilfields prove after prospecting not to be worth working on a large scale, half the out-of-pocket expenses will fall upon the Standard Oil Company. If, on the other hand, they are worth developing the Standard Oil Company will provide the experts and equip the fields with the most modern plant. From a provincial point of view the expenditure for the installation of refineries, pipe-lines, etc., will be of great benefit to the residents of the districts concerned. The arrangement between the Chinese Government and the Standard Oil Company will be of particular interest to the Shell group in view of the rate war which began in 1910.

On page 374 we give a translation of the Chinese text of the Agreement between the Government and the Standard Oil Company.

THE MANILA CAPITOL BUILDINGS

As a last bequest to the people of the Philippine islands, William E. Parsons, the consulting architect, will leave the completed plans for the capitol group which is to face the new Luneta in the Manila beautiful of the future, says the *Manila Daily Bulletin*, and continues:

Slight modification of the Burnham plans have been found necessary in carrying out the plan for the administration group, but the general ideas of that artist have been followed wherever practicable. The contemplated arrangement of the various buildings according to the plan of Mr. Parsons has been depicted in miniature model by the well known woodcarver, Juan Tampinco.

The model shows the entire section to be covered by the proposed structures and the new Luneta, a district extending from the waterfront back as far as calle Nozaleda, upon which one group of the buildings will front. Directly back of the position occupied by the Rizal monument, will be the great court of honor, in the center of which a large lagoon is set within a border of tropical trees. At the foot of the lagoon is the entrance to the capital building, while on each side of the lake are located the buildings which will house the various bureaus of the insular government.

Directly behind the proposed capitol is calle Nozaleda, and on its further side is a small plaza, semi-circular in shape, into which face the buildings which will be occupied by the supreme court and the various branches of the legislature. The proposed library building will occupy the site now filled by the bureau of education building for the present Philippine exposition.

The plans for the capitol building are absolutely complete, and the working prints could be prepared on short notice. The cost of this building is estimated at P. 1,650,000. The entire group will cost approximately P. 15,000,000, according to the estimates of the architect's office.

The present shortage of funds which appears to be facing the government will in all probability prohibit the construction of the buildings during the present year, but it is understood that work will be begun upon those which appear to be most essential as soon as there be money available for the work. The Philippine library and buildings for the legislature will probably be started first.

MODERN PAPER MILL AT KONGMOON

Writing from Canton on January 22nd, M. Reynaud of the French Consulate says: After a standstill of two years occasioned by the Revolution, the industrial development of the Cantonese region, mentioned in a number of reports previously sent from this Consulate, enters into a new phase of activity, owing to the prospects of peace and order under the new provincial government.

The latest manifestation of this industrial activity has been the recen putting into operation of a modern paper mill at Kongmoon, the open port situated at the mouth of the West River on the great commercial route from Hongkong to Kwangsi.

The capital of this paper mill, fixed provisionally at $300,000, is exclusively Chinese; a part has been subscribed by the Chinese emigrants residing in the United States. The director of the workshop is a Chinese engineer graduated from the school of arts and trades at Tokyo.

The installation has been made under the direction of a Japanese company, which, by a precedent much practised in the commercial centres of this country, has thought right to put on the machines as they were being set up, a Japanese mark. But, in reality, all the workshop material comes from Germany.

According to the first tests, the production of the mill stands at present at about fifteen tons of paper per week.

The raw materials used for this paper mill are old rags and rice stalks; the paper produced has given entire satisfaction to the promoters of the enterprise, and the quality is good.

The future prospects of this new industrial enterprise are excellent. On the one hand, it is sure to find in unlimited quantities the raw materials which are used, and at prices given for paper in this country, it will reap good profits. On the other hand, it has the advantage of a very important and very frequented route by water which will permit the reception of raw materials and enable the products to be very cheaply distributed.

Finally, and this is the principal argument in favour of the success which can be predicted for this enterprise, the consumption of paper has developed so at Canton and in the principal towns of the Delta, that the products of the local industry, aided by the cheapness of the raw material and labour, will not fail to oust the foreign importations which up to the present has furnished almost all the paper, which can now be manufactured in the workshop of Kongmoon.

Some figures will be useful to justify the importance of this last argument, which show clearly the chances of success the modern paper industry in Kwangtung possesses.

In the course of the last three years the value of paper imported, principally from Germany and from Sweden, in the principal open ports of the Cantonese delta has been as follows:—

1910	2,580,620 francs
1911	3,263,700 „
1912	3,708,410 „

This rapid increase in the consumption of paper is due mostly to the increase of the number of periodical journals and reviews published at Canton.

The conclusion is easily formed on this evidence that industrial enterprises like that which is organised at Kongmoon, have before them a splendid future and the success of this last will shortly lead to the creation of similar mills. The abundance of the raw material, the facility of communication by water and the cheapness of labour, will permit of advantageous competition by these with the importations of foreign paper.

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RAILWAY DEVELOPMENT OF WESTERN CHINA

BY ARTHUR J. MOORE-BENNETT.

Whilst in the balance of China, the railways so far projected, are for the most part designed to help China open up her vast mineral and other resources, here in the West, the roads under discussion seem to leave out all considerations of trade, and economic factors generally, and to consider railways only from their political, and military value. Whilst this policy may be a progressive one on the part of Great Britain, the writer fails to see why China should be called upon to foot the bill for roads that cannot advance her commercial interests and would appeal to all friends of China, to get the best possible lines to develop trade—and not militarism.

All roads, whether projected or existing, may be divided into two classes, the first to include all roads that cannot by reason of the sea board connections and geographical positions, assigned to them, be other than political or military roads, the second to include all roads that by reason of their route, may be looked to develop the three Western provinces of China.

In the first class must be put the Tonkin railway, the proposed Bhamo, Tengyueh, Tali, Yunnanfu railway, the Suifu railway, the Lashio, Kunlong, Nam Ting, Yunchou, Talifu railway.

In the second class the Poseh, Yunnanfu railway, the Singyifu and Nanningfu railway, and the Bhamo, Tengyueh railway.

The Tonkin railway is included in the first category inasmuch as, whilst its position geographically should make it the most favourably situated to serve the central part of Western China, the policy of the French government in putting prohibitive transits on merchandise, en route for and from China, prevents the road developing Yunnan or Kweichow, as it otherwise would, and until these rates are removed, the Tonkin road must be looked upon as more of a military line than anything else.

In regard to the Bhamo, Tengyueh, Tali, Yunnanfu line, whilst Bhamo is not on a railway, yet it is the head of navigation on the Irrawaddy, and has a fine service both freight and mail, all the year round, and a line from Bhamo to Tengyueh, up the Taiping River,—a distance of 123 miles in an easy country to within 15 miles of Tengyueh, where hills are encountered,—would undoubtedly pay, not only for the through traffic, but for the local traffic, especially in rice and foodstuffs, but if the line is carried through past Tengyueh East towards Talifu, the writer cannot believe that such a line can pay.

Bhamo is at an altitude of about 354 feet above sea level. Tengyueh, 123 miles N. N. E. is at an altitude of about 5,350 feet; continuing eastwards, the lay of the land, is mountain ranges running north and south, dividing first after Tengyueh, the Shweli watershed, from the Salween, then the Red River from the Mekong, and taking any route from Tengyueh, it is necessary to climb and fall an aggregate of over 12,900 feet, not counting rises of under 100 feet, in a distance of 115 miles tangentially, or about 188 on any line that can possibly be taken. Whilst in engineering, nothing is impossible, yet economically as the line will run through a most sparsely inhabited country, it cannot be seen that a line that will in the first place not admit of merchandise being sent into China without transhipment at Bhamo, and will then have a haul of over 312 miles to Tali, another haul of 228 miles to Yunnanfu, or including the distance from Bhamo to the sea by boat, a total haul from sea board to railhead at Yunnanfu of 1,380 miles, can possibly be considered in the light of an economic factor built for the well-being of commerce.

Again, the cost of the first section, Bhamo to Tengyueh, will be light, not exceeding £8,500 for a meter gauge line, but this will be offset by the cost of the second section that will cost at least £20,000 per mile, and it is on this section, that the least local traffic may be expected, whilst the third section will average about £10,500 per mile so that at the best—using Indian methods of construction—the whole line cannot be built for less than £8,000,000 including rolling stock, which sum might be spent in many ways, far more calculated to help China develop.

The Lashio, Kunlong, Nam Ting, Yunchou, Yunnanfu line, whilst avoiding the heavy grade crossings of the more northern line, is open to the objection of length, as Lashio is 570 miles from Rangoon, and the line between Mandalay and Mamyo ascends a face of the hills forming the Eastern wall of the Irrawaddy, by means of a switchback—and the whole road at this section which rises 3,600 feet in less than 30 miles at 4 per cent. grades, is not now, and is never likely to be capable of handling heavy freight; moreover, as no line in Burma connects with the Indian systems, and as the Burma railways are meter gauge, as against the standard and broad gauge of the main Indian systems, it is difficult to understand how such a line could be made to connect unless the gauge was changed throughout.

As projected, the length of the line from Rangoon to Siakwan or Tali, via Yunchou, is 989 miles, and from here to Yunnanfu, about 225 miles—hence the haul from the sea board, in this case, can be reckoned at 1,220 miles.

As regards the cost of this line for meter gauge, the writer—who has been over the whole route—cannot believe that it will average less than £17,000 per mile for the 212 miles between Kunlong and Yunchou, and from £10,500 to £15,000 per mile for the remaining sections.

Both these routes lie open to the objection, that the terminii on the sea board are in foreign territory, in both cases, and merchandize would always be subjected to outside interference, in time of war, whilst in times of peace, taxes to any amount can be levied on goods in transit.

*The Suifu-Yunnanfu line cannot be said to be a commercial line, as the terminus on the Yangtsze is not the head of navigation, and goods cannot be brought up to Suifu without very considerable cost and risk. In length, as projected, this line is 412 miles; the first section following down the Nui Lan river from its source near Yunnanfu to a point about 22 miles south of Chaotungfu, is easy country, but very difficult work exists between this point and Chaotungfu, and again from Chaotungfu to Takwan Lo with heavy grades, long tunnels and side hill cuts whilst just west of Takwan the line descends by means of a switchback to the Heng Chiang, which at this point falls 3,000 feet in less than 20 miles. The total cost of this line has been estimated at £7,000,000 for American practice line, but if a Continental or British Syndicate was building, the cost would probably be nearer ten million sterling. It is stated locally that this line is desired to develop local trade between Yunnan and Szechuan, but unless Yunnan can be coupled up to a sea board line to the south or south-east, it is hard for anyone living in the country to understand how such a line can be of use in any direction, as Szechuan certainly could not afford to either receive or send merchandise via Yunnanfu to Haiphong, when she can ship it on Yangtsze ports.

This, then, disposes of the first class of the proposed railways. The writer has the whole of the technical details relating to every survey made in the West but as these are not of general interest, he proposes only to touch on the economic side in this article, leaving the technics to a future paper.

To the East and South-east of Yunnan, there rises the West River. The height of navigation on this river lies as a point Poseh 284 miles from Yunnanfu as the crow flies,—or if river conservation works were carried out,—at Pai-Ai, 249 miles tangentially.

This point then, is the economic point of Yunnan, from a development standpoint, and to this point three surveys have been made. The first was made by Mr. K. S. Low, in 1910 from a point below Poseh to the town of Lopingchou, which lies 99½ miles from Yunnanfu. Mr. Low for reasons† carried his line from the West River up a tributary—the Lorli river—to the north-west, from these ascended a range and dropped into the main stream of the Hung Shui Chiang, which he ascended to a point south and East of Lopingchou, where the steepness of the cliffs drove him up a tributary from the north, which he ascended, then descended, another small creek into the main river again at a point nearly due east of Lopingchou, when he left the main stream and turned west up the Twang Chang Ho, a river running past Loping 3 miles to the north of the town. Mr. Loh proceeded up this stream to a point east of the town of Yuehchow, and there the survey stopped.

According to Mr. Low's figures, which were given the Central Government, this line was 396 miles long, from Yunnanfu to Yuehchow (estimated) to Loping, and Poseh, and the cost—which the writer considers excessive—was placed at Tls. 51,000,000 for standard track, 80 lb. rails 2½% ruling grades, 12 degree curves, line and rolling stock complete.

The second survey, made by Mr. W. S. Dawley and the writer, was one run during 1912 and 1913. The route was Yunnanfu, Yanglin, Chuchingfu, Yuehchow, then down the Twang Chang Ho to Lopingchow, from thence due south to the crossing of the Pa-Da-Ho, then up a tributary—the Ching Shui Chiang—and across a ridge, a direction nearly on a "B" line with Poseh, to the head waters of the West River, from thence across the right wall of the main West River into the Hsi Yang Ho, joining the West River, ten miles above Pai-Ai, and continuing down the right bank to Poseh.

This line is 406 miles long, penetrates a richly settled country, passes en route, coal, copper, and spelter fields of known richness, and for a standard gauge track, 75 lb. steel, 12 degree curves, 2½% grades, can be built for £6,150,000, including river conservation works on the West River to give 24" water at all seasons.

The third survey of this line was made last year, and the route chosen was the most direct possible, viz., Yunnanfu, I-Yeang Hsein, Da Shao, Dia Dee, Shih Tung Hsein, proceeding to the Pa-Da-Ho south of Loping direct, shortening the second survey by 36 miles, and bringing the total estimated cost down to £5,640,000.

During the whole length of both surveys as above (2 and 3) the projected lines run through the richest and most thickly populated portions of Yunnan and Kwangsi, in easy country, presenting no engineering difficulties of any kind, and either route, would bring Yunnan in direct communication with Canton and the Southern sea board.

In regard to the Shingyifu, Nanningfu line, this, so far as the writer is aware, has never been surveyed, but the country from Shingyi, directly south-east, is easy, being for the most part rolling hills, of under 5,000 feet altitude, whilst the bulk of the country lies at 3,000 feet and under. (It should be noted, that even the best maps put the positions of Poseh, Shingyifu the Hung Shui, and all this section, incorrectly, as Shingyi lies further south, and Poseh further east than is shown.)

If railways are to be built in the West, to develop China, then the soundest lines are certainly those which will terminate at Canton. Ocean freights from Europe and America are better to Hongkong, than to Hankow as a rule, and until the Yangtsze becomes navigable up to Suifu, for cargo craft, and until the dangers to navigation can be removed in the river, below this point no line that will not give Yunnan, at least as good a service as the Poseh one should be discussed. Connection could be made with the Yangtsze valley line by a branch from Lopingchow to Shingyifu, a distance on a line of 103 miles, so that for 550 miles of railway would, with the connecting lines, join up Yunnan to Hankow, and to the West River navigation ports, or if the Poseh line be continued to Nanningfu, a total length of under 1,000 miles of line, would put Yunnan, Kweichow and Kwangsi within three days of Hongkong and also in touch with the Yangtsze.

To build lines to a sea board on the Bay of Bengal—600 miles as the crow flies, or to Bhamo, 360 miles in a line, through the worst country in Western China, may be good for foreign countries; it is certainly not developing a poor country to the best advantage, although it is admitted that the Bhamo, Tengyueh line, would be good, if it stopped at Tengyueh, as up to this

* When Mr. Moore-Bennett wrote this article the Banque Industrielle Agreement for a line connecting Yunnanfu with Chungking had not be enmade.—Ed.

† Mr. K. S. Low states that his route was selected after instrumental survey, and follows almost direct valleys; that he desired to escape taking a route which would compel a junction with the French railway south of Yunnanfu, that the lay of the mountains were such that it was more advisable to keep well to the east of Yunnanfu; that rich valleys are tapped by his route. *Ed.*

point no engineering difficulties are encountered, whilst it would serve the whole of the west of Yunnan and, unless the Tonkin railway removed its rates, a considerable portion of Central Yunnan, but in no sense can any line coming from the west develop, Kweichow, Kwangsi, or Szechuan, to the best advantage.

The Suifu line, might justify its expense by reason of its opening up of the Tung Chuan Copper, spelter and coal fields, and by reason of it allowing China to concentrate troops at any point along her Western frontier, but it will be to the West River lines, that the West must look for the salvation that cheap transport to the sea gives to countries in a backward state of development.

A close study of the situation, and of any ordinary map of Yunnan will, the writer feels, surely convince any fair minded person that if China is to be saddled with a debt of seven to ten million pounds for railway construction, then the railway to be built should be one that will open up the most country at the least expense—it being borne in mind always, that, first, any line that is not entirely in Chinese jurisdiction, from railhead to sea board cannot be considered satisfactory, and, second, that ocean freights anywhere are cheaper than rail freights ever can be.

The writer has travelled, continuously in Yunnan for six years, and knowing the West, he cannot conceive a more unfair road, than the suggested Tengyueh, Tali and Yunnan line in view of the known easy route to the West River watershed.

The road can never compete with the Tonkin line, if the latter removes its prohibitive dues, which it is likely to do the minute competition takes place, and as a consequence, China will be saddled with 350 miles of expensive track—built at enormous cost, of a different gauge to her main trunk lines—a white elephant of no value to any save British Commanders-in-Chief in India.

In conclusion, any technical details of the lines under review will be gladly furnished to interested parties—on application to the Editor of the FAR EASTERN REVIEW.

INTERNATIONAL INTRIGUES IN CHINESE RAILWAYS

In view of the disclosures made in the article in the January issue of the FAR EASTERN REVIEW in regard to international intrigues in connection with the railways of China, it is significant that the Belgian Legation at Peking has been constrained to notify the Chinese Government that the Lung-Tsing-U-Hai Railway Loan is Franco-Belgian, not purely Belgian as the Chinese were originally given to understand. This notification was also prompted by the fact that the French capitalists refused to recognise the appointment of any but a French chief engineer, which the Belgians were willing to accede to, but which the Chinese opposed on the grounds that the French had no say in the line since the line was purely Belgian. An allusion to this difficulty was made in the article in the January issue of the FAR EASTERN REVIEW.

It is also interesting to note that the British have protested against the Lung-Tsing-U-Hai line terminating at a port on the Yangtsze instead of at Haichow as originally proposed. It is reported that the Chinese have notified the Belgians that the terminus of the line must be elsewhere.

PROPOSED NEW RAILWAYS IN CHINA

Active negotiations have been proceeding of late between the British and Chinese Corporation, Limited, and the Ministry of Communications, for the construction of a line from Nanking to Nanchang, the capital of Kiangsi province, and to Changsha, the capital of Hunan province, where a junction will be made with the Canton-Hankow railway. The line will, of course, be an extension of the Shanghai-Nanking railway, and will put the capitals of three provinces in touch. As a matter of fact if the Pauling railway is built to Kweichow and connection is made with Yunnanfu, there will be railway connection south of the Yangtsze direct from Shanghai to the capitals of Kiangsu, Hunan, Kweichow, and Yunnan provinces, with possibly a branch line to the Yangtsze opposite the capital of Anhui province. The British and Chinese Corporation are also negotiating for railways north of the Great Wall, from Hulutao, on the Peking-Mukden line, to Chaoyangfu (a map of which appeared in a recent number of the FAR EASTERN REVIEW) on to Chihfeng, to Changtehfu (Jehol) and to Tungchow, near Peking, with possibly an extension to Dolonor. The Chinese are anxious to have these lines built, but the arrangement between Britain and Russia under the Scott-Muravieff agreement will probably prevent British capital operating, and the Chinese may possibly have to build this system with their own money.

In Fukien province, which the Japanese have endeavored to ear mark as their "sphere" in southern China, an effort is now being made by Japanese capital to secure a long-cherished railway from the port of Foochow north-westwards to Nanchang the capital of Kiangsi province. This line would connect with the Japanese line which is now in course of construction from Kiukiang on the Yangtsze River, to Nanchang, thus giving through connection between the Yangtsze and Foochow on the coast. The railway is an important one for Fukien province and must be built some day or other, even if the Chinese repulse the Japanese overtures now.

JAPAN AND THE HANYEHPING LOAN

A storm of protest has arisen in certain circles in China in connection with a loan transaction made by the Hanyehping Company—the organization which controls the Hanyang ironworks, the Tayeh iron mines and the Pingsiang collieries,—with the Yokohama Specie Bank, of Japan. The loan is $15,000,000, of which $6,000,000 was to be devoted to paying off obligations of a current nature, and $9,000,000 to the improvement of the equipment of the Tayeh iron mines. The loan was to bear 6% interest, and the principal was to be repaid in the shape of iron ore to the quantity of 13,000 tons per annum, to be delivered at a price fixed for ore of varying grades. The agreement provides that a Japanese engineer and a Japanese accountant shall be engaged by the Company for the purpose of supervising the expenditure of the money.

When the fact became known to certain sections that a loan had been contracted by this Company with the Japanese an immediate outcry was made that the Company was "selling sovereign rights," and an attack was levelled at the Minister of Industry and Agriculture, Mr. Chang Chien, who was accused of consenting to the deal, if not of participating in the actual negotiations. Public meetings were held, the native newspapers opened a campaign, and telegrams and letters were sent to Peking demanding a cancellation of the agreement on the grounds that the Hanyang ironworks and the subsidiary industries at Tayeh and Pingsiang—constituting China's most vital existing industry—were being handed over lock, stock and barrel to Japanese control.

It is stated that the protests were supported both by President Yuan Shih kai and Vice-President Li Yuan-hung, The Minister for Industry declared that he was not involved in the transaction in any way, and in due course despatched a telegram to the head office of the Company instructing that the draft agreement for the loan must be submitted to the Ministry for approval before it is signed and describing it illegal if it has been signed without first being submitted. About the same time Mr. Sheng Hsuan-huai, representing the Committee of Directors, (and who as Minister of Communications in 1911 devised a scheme for nationalisation of railways which precipitated the revolution*), applied to the Ministry for approval of the loan on the grounds that the Company was a private one, recognised by the Manchu Government as such, and that therefore it was privileged to borrow money without reference to the Government. He added that in May, 1911, owing to shortage of funds, an arrangement was come to with the Japanese Iron Manufactory and the Yokohama Specie Bank for a loan of $12,000,000, of which

*See Revolutionary Number of the FAR EASTERN REVIEW April, 1912.

$3,000,000 was paid up, and the balance withheld owing to the revolution. The loan had since been resumed, and the $9,000,000 was to be paid in three years for the expansion of the Tayeh works and another amount of $6,000,000 was to be secured for the purpose of repaying all short term loans for which the Company had to pay heavy interest. The loan agreement was signed according to former procedure on December 12 last year, and in the annex to the agreement it was stipulated that the Company might repay the loan with Government funds so long as those funds were not borrowed from any other foreign concern. The Government may, therefore, if it considers the loan disadvantageous, give assistance to the Company to repay it, and the Company will be glad to negotiate with the Japanese Bank to repay the money.

The Minister of Industry replied in blunt terms to this document, pointing out that on June 6, 1912, the Government announced throughout the provinces that no loan would be valid if secured upon mining properties, without the sanction of the Government. As the agreement between the Hanyehping Company and the Japanese Bank contravened these orders the loan was invalid, and the Minister declared the agreement null and void, at the same time demanding that the Company should wait for instructions which would be given after the Ministry consulted with the Board of Finance.

It would seem that the Government has effectively answered the protests of the people, and now it will have not only to see to the saving of the Company from bankruptcy but might also be called to account by the Japanese. The contention of Japan is that its financiers have been involved in the Hanyehping concern for more than twelve years, having loaned up to $20,000,000, and that those interests have to be protected. Insofar as the operations of the Japanese might conflict with other nationals in the Yangtsze Valley the Japanese hold that as they have vested interests in the region, and as the supply of iron ore and coke is essential to the sustenance of Japan as an industrial and naval nation, they must decline to be influenced by considerations which are solely political on the part of other nations. The Japanese have been buyers of big iron from Hanyang for many years, while at the same time they have been constant customers for iron ore from Tayeh and coke from Pingsiang. This trade is vital to them as a nation, and it is one which they will not permit to be disturbed without a struggle.

Mr. H. C. Carter, the Engineer-in-chief of the Shasi-Shingyi line recently allotted to Messrs. Pauling and Company to build by contract, has arrived with Messrs. C. F. Tristram, B. F. Nell, and E. A. Scott to make a reconnaissance of the route, and subsequent survey. The reconnaissance will take several months to complete.

COST OF RAILWAY BUILDING IN SOUTH CHINA

Under date of January 22, Mr. Frank Grove, M. Inst. C.E., and Engineer-in-chief of the Chinese Section of the Canton-Kowloon Railway, writes to us in connection with the costs of labor and construction work in the south of China. We are very pleased to publish Mr. Grove's letter, as a valuable contribution to the subject. He writes as follows:

To the Editor of the FAR EASTERN REVIEW.

Sir,—With reference to Mr. Bronson Rea's interesting article entitled "An Appreciation of China's Railway Engineers" in your November issue, allow me to point out that the rates quoted therein are in one particular misleading, though doubtless quite unintentionally so.

I refer to the paragraph as follows: "The average cost of earthwork on the Shanghai-Nanking Railway was 15 cents silver per cubic yard, on the Canton-Kowloon line 33 cents per yard, whereas the average cost per cubic yard on the Changshui extension has been about 6 cents per cubic yard."

I have stated in a paper on the construction of the Canton-Kowloon Railway, Chinese Section, that the average cost of finished earthwork of all classes (which, of course, included rock), also added contingencies, and protection works, did not exceed 32 cents per cubic yard; in fact the whole cost of earthwork, and rockwork, under its head of accounts, works supervision, explosives, stone pitching, retaining walls, tools (but not "plant" unless broken up and so "charged off" to earthwork) was divided by the total quantity, an average rate thus resulting.

The context of my paper showed that protection works were remarkably heavy, in one cutting alone $90,000 was spent on piling, retaining walls, &c., in order to deal effectively with a peat bottom and slipping sides, also 5 miles or so of high embankment were faced with stone, besides usual stone protection and turfing throughout. The percentage of rock, while, but a small portion of the whole, was by no means inconsiderable—actually about an eighth, a usual proportion in such country.

The rate was given, therefore, to engineers for estimating purposes where conditions are similar to those holding here which were fully described, namely, very high banks in flooded country, deep cuttings with treacherous slopes, &c.

It has not come to my knowledge that local Chinese engineers are able to obtain lower rates than foreign engineers. The old story of interpreters, employed by the latter, making huge "squeezes," has no bearing in recent years whatever it had in the past.

Interpreters are not needed. Contractors mostly speak English; local rates are well established, especially near large centres. Public and sealed tenders are taken too, and in the case of this railway, out of 30 such, only one contractor quoted an initial rate for earthwork of 48 cents per 100 c.ft. or, say, 12 cents per cubic yard, which rate has never been reduced. There is evidence to show, too, that contractors made little money—no suicides were reported as seems to have been the case in the North, but many tears were shed and the foreign engineers also proved themselves hard hearted! Professional earthwork labour is very poor near Canton, and Kowloon, owing to every one being very well off, and probably labour rates generally are higher than anywhere else in China. Importation of coolie labour is not permitted.

An interesting case occurred in 1909. Some 1,000 coolies brought from Hunan by an enterprising contractor were stated to have been branded and led away in chains, a most unlikely proceeding having regard to the bellicose character of the Hunanese. Repatriation promptly followed by order of the Viceroy, and, to add insult to injury, a claim was raised for costs! I merely mention this to show the difficulties of introducing new factors in competition such as would lead to a reduction of rates and a consequent economy.

I am at one with Mr. Bronson Rea in his appreciation of work done by Chinese engineers and in his well wishing towards the individuals—among all engineers there should be, and generally is, comradeship, mutual trust and appreciation, though unfortunately this may not be so evident in China as elsewhere. And for myself I cannot help feeling that such mutual understanding can only be obtained or improved by a just and frank recognition of the fact that all experienced engineers, of whatever nationality, who are *fit to be trusted* in charge of important works, are one and all equally able in carrying out the obligation of their duties.

To turn again to the matter of comparisons, it is somewhat strange that rates paid on a railway built in the extreme north of China, where labour is proverbially cheap, should be set against rates paid in the extreme south where conditions are so entirely different.

The statement made that "labour costs are generally about 25 per cent. higher in the South than in the North," is my own. This I must qualify in the case of *earthwork* and *unskilled* labour. It can be confirmed by anyone who cares to enquire that it is much nearer 100 per cent.—that is, the Northern labourer would be paid 25 cents against the Southerners 50 cents, though on piecework he would probably do more work and thus earn proportionately more. Thus the difference in initial rates can be amply accounted for.

Engineers who are able to carry out works with extreme economy owing to local conditions are, I grant, fortunate, for comparisons though sometimes "odious" cannot well be avoided. What I have written, however, will, I hope, enable a fairer conclusion and remove some misconceptions.—Yours, etc.

FRANK GROVE, M. INST. C. E

PROSPECTS OF WEIHAIWEI

A correspondent writes from Weihaiwei:—The building boom continued right up to the middle of December, when heavy frosts stopped the work. The foundations of new buildings for Fock Tai & Co. have been laid, and the buildings will be erected as soon as possible in the coming spring. We shall shortly have business houses scattered all over the mat'on, extending from near the hospital on the east side right down to the city wall. Land for building purposes has gone up in some parts to four and five times its former value.

Industries of various kinds are being begun all over the Promontory. On the mainland, ladies' hair nets are being made and shipped to Germany, the hair being first of all sent from China to Germany to be prepared and re-shipped here to be made into nets. Women and girls learn the process of making these nets in a few hours, so it is giving employment to many all over Eastern Shantung. At Yungchenghsien a weaving factory has been started, employing about fifty hands, and is proving quite a success.

In Shihtao an enterprising Huanghsien merchant, who has a weaving factory and dabbles in photography, has started a factory for making a kind of isinglas or Iceland moss, from a sea grass called Lungtsuts'ai. It seems to have a big future before it.

THE TSING HUA COLLEGE, PEKING

With special reference to the Bureau of Educational Mission to the United States of America.

[BY RICHARD ARTHUR BOLT, A.B., M.D., PHYSICIAN OF TSING HUA COLLEGE.]

In the summer of 1881 the first Chinese Educational Mission to the United States of America, under Yung Wing, came to its untimely end. The fate of the Mission was sealed in 1876, when Yung Wing accepted the post of Associate Minister to the U. S. A., leaving his pet scheme open to the machinations of the Commissioner of the Educational Mission, Wu Tzu-ting. Mr. Tong Kaison, one of the original Yung Wing students, has aptly summarized the different accusations which were brought against the students as follows: "The boys had, by imbibing the spirit of American institutions, lost all sense of duty and obligation towards their Sovereign and their country; they had adopted American customs, sentiments, habits of life and thought; they entertained, by reason of their republican education and training, the most radical and subversive opinions and the most partisan feelings; consequently, to patronize such men was to sow the seed of future discord and rebellion; they had all rejected the doctrines of Confucius, and some of them had embraced the tenets of an alien faith; they were impatient of authority and cherished contemptuous opinions of their government; and, lastly many of them had shown a desire to become naturalized and to marry and settle down as citizens of the United States."

Whether true or not, it is easy to understand how Chinese official circles of thirty years ago would accept such accusations and make capital of them. The bringing of the boys back to China at this juncture, and the breakup of the Mission, produced the very results which the Commissioner and his colleagues had hoped to avoid. It is interesting, therefore, to study the causes which have led to the formation of another Educational Mission and the safeguards placed about it in order to escape the pitfalls of the former one.

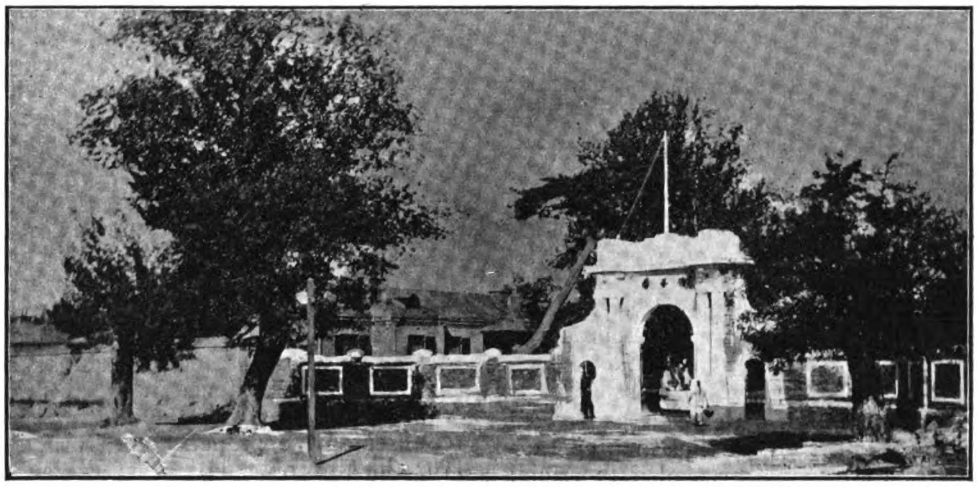


Photo by R. A. Bolt.

Main Entrance to Tsing Hua College.

The relations between the United States and China have, on the whole, been most friendly, despite the fact that a considerable labor element on the Pacific slope forced the Anti-alien Laws, and have succeeded in keeping them in force ever since.

As the people of the United States have come into more intimate contact with the better merchant class and students of China a high regard for their integrity and ability has developed. The United States Government itself has shown its friendly feelings by numerous exchanges of diplomatic courtesies, by its decided stand for the "Open Door" in the Far East, by its insistence upon the "Integrity of the Chinese Nation" and by its early recognition of the Chinese Republic. The most notable act of friendship of recent years was the remission of a portion of the Boxer Indemnity Fund. According to the Protocol of September 9, 1901, the United States was to receive as indemnity from China the sum of $24,400,000 gold. After making arrangements for the payment of all just claims, and adjusting some differences which were not forseen at the time the original indemnity was decided, Congress of the United States passed a bill authorizing the President to arrange to remit to China the remainder of the indemnity. The original indemnity bond was modified from $24,400,000 gold to 13,655,492.29 gold with interest at 4% per annum. Of this latter amount $2,000,000 gold were held pending hearings on private claims within one year. In round numbers, then, this gave the Chinese Government $11,000,000 gold, to be remitted from the total indemnity—collected quarterly—during thirty years.

An envoy was dispatched from China to the United States to thank the President for this "act of friendship." In a note from Prince Ch'ing to Minister Rockhill, dated July 14, 1908, the purpose for which the money was to be expended is stated as follows:

"The Imperial Govcrnement wishing to give expression to the high value it places on the friendship of the United States finds in its present action a favorable opportunity for doing so. Mindful of the desire recently expressed by the President of the United States to promote the coming of Chinese students to the United States to take courses in the schools and higher educational institutions of the country, and convinced by the happy results of past experience of the great value to China of education in American schools, the Imperial Government has the honor to state that it is its intention to send henceforth yearly to the United States a considerable number of students there to receive their education. The Board of Foreign Affairs will confer with the American Minister at Peking concerning the elaboration of plans for the carrying out of the intention of the Imperial Government."

The plans finally evolved resulted in the formation of the "Bureau of Educational Mission to the United States of America." This Bureau was under the joint control of the old Wai Wu Pu (Board of Foreign Affairs) and the Hsüe Pu (Board of Education.) All affairs pertaining to the selection and sending of Chinese Government students to the United States, and their entire support, was to be under the jurisdiction of this Bureau. The Wai Wu Pu thereupon appointed H. E. Chow Tze-chi as Director, and H. E. Tong Kaison Co-Director, to confer with Mr. Fan Yuen-lien as Co-Director from the Hsüe Pu. Dr. C. D. Tenney, then Chinese Secretary of the American Legation at Peking, was delegated by the American Minister to represent him in an advisory capacity to the Bureau. Comprehensive "Rules for the Selection and Sending of Students to America" were drawn up by the Bureau and sanctioned by an Imperial Decree of July 10, 1909.

It was originally deemed advisable to select students on competitive examination from any school in the different Provinces. In this case the Bureau simply acted as an examining body with considerable discretionary powers. According to this plan the first competitive examination was held in Peking at the Yamen of the Board of Education in September, 1909. Over 600 students came up to the Capital from practically every Province to try for the coveted honor of being chosen to go to the United States. After a preliminary test in Chinese and English Literature and Composition, the number of students considered eligible to proceed with the final examination was reduced to 80. These were further examined in Algebra, Plain and Solid

Geometry, Trigonometry, German and French, Latin, Physics, American and English History, History of Greece and Rome, and Chemistry. A final selection of 47 studente was made. It was discovered from this examination that the greatest difficulty was shown in the proper use of the English language. After a medical examination by the Physician to the American Legation Guard, and suitably equipping themselves at Shanghai, they sailed for America on October 12, 1909, under the care of H. E. Tong Kaison. The students were distributed among a number of the leading Academies and Colleges of the United States.

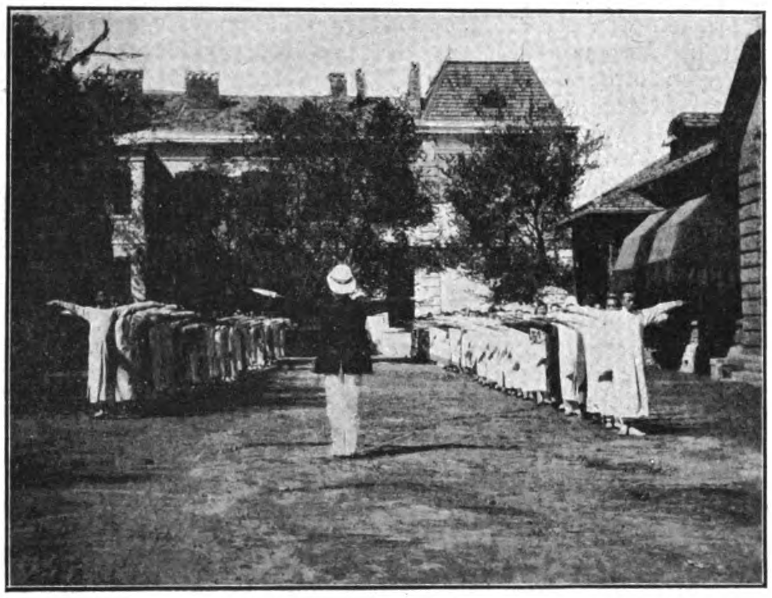
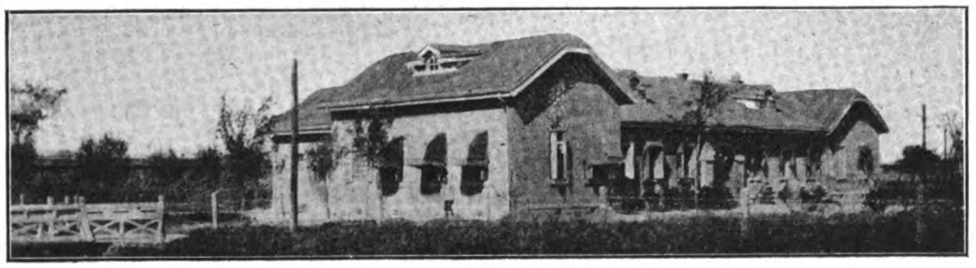


Photo by C. B. Malone.

Regular Daily Exercise at Tsing Hua College. Main High School Building in Background, Assembly Hall to right in picture.

A second examination was held in the Law College, Peking, from July 21st to July 29th 1910. This time 400 students from all over the Empire participated, the Provinces of Kiangsi and Kwangtung being most largely represented. The list of examination questions was practically the same as at the first examination. After the preliminary test 172 boys were allowed to proceed with the finals. Of this number 70 were chosen to go to America. It was stated that a larger number of these students were able to enter American colleges without additional preparatory work, but it was forcibly brought home to the examiners that more thorough preparatory work would have to be done in China before the students could do full justice to their advanced studies in the United States. The original plan contemplated that 100 students would be sent each year for the first four years and 50 per year for a period of 29 years. It was found impossible to select so large a number at first well enough prepared in English to enter the higher educational institutions. Then came the Revolution which crippled the finances so much that the original plan had to be held in abeyance.

In order that the students should be better equipped to enter American universities without further loss of time in preparatory schools in the United States it was finally decided to establish under the Bureau a school in which all future Government students, to be sent to the States on the Indemnity Fund, should be trained. Strong arguments were advanced for the establishment of such a school in the vicinity of Peking. It was urged that while the munificient sum of $150,000 gold was available annually it would be a good investment to build a model institution capable of developing into the best in China. For such an institution the Chinese Government, at the expiration of the "indemnity fund," would certainly find other means of support. In the outline for this new school it was stated that "American teachers, both for the advanced and the elementary classes shall be engaged, and the methods shall be those of American schools, so that the students by their familiarity with American methods may suffer no inconvenience in entering American schools. This school shall be solely for the purpose of giving temporary instruction to the students chosen from the different provinces in order to test their character and ability."



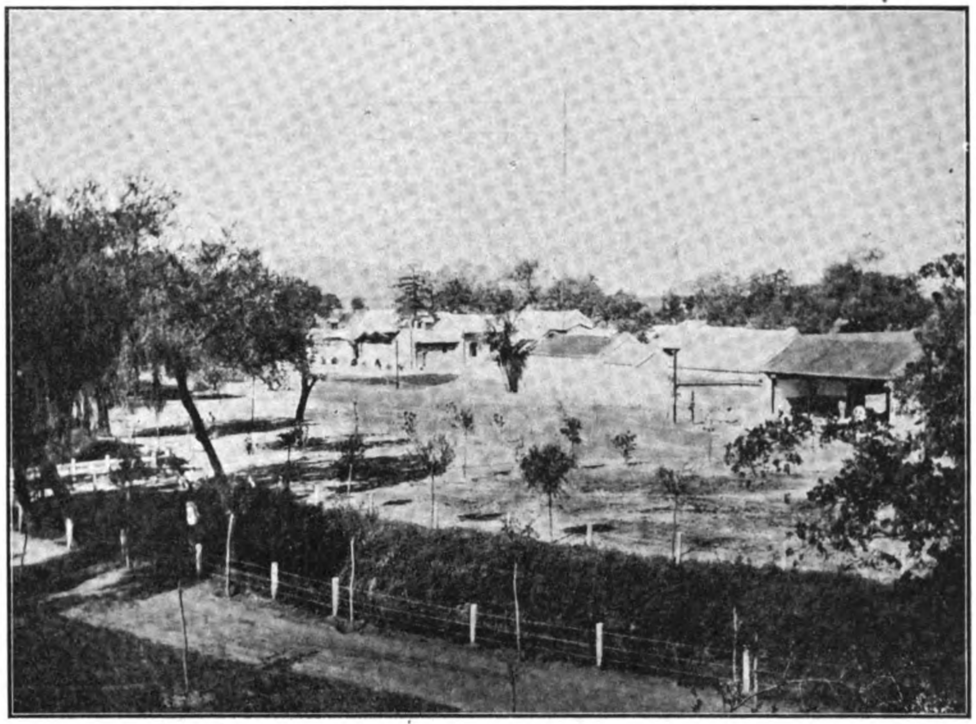
Hospital and Dispensary Building, Tsing Hua College

The manner of selecting the American teachers for this school is worthy of note, as showing the confidence the Directors placed in a man representing avowed Christian ideals and principles. After most careful consideration the Directors, acting upon the suggestion of Mr. Tong Kaison, decided to delegate to Mr. John R. Mott the securing of suitable teachers for the new "Indemnity School." Knowing that Mr. Mott was in close touch with organisations in America which could indicate well qualified teachers, and having the necessary office machinery at his disposal, proved the farsightedness of the Directors in placing in his hands the selection of the teachers. After considerable deliberation an American faculty, consisting of nine ladies and eight men, was selected. This number included a Physician and a Physical Director for the College. These teachers, with the exception of the Physical Director, sailed from San Francisco on the s.s. "Tenyo Maru," January 18, 1911. They were officially received and royally entertained at Honolulu, throughout Japan and in Shanghai, arriving at Peking February 21st. Here they were detained some six weeks awaiting the completion of the new buildings at Tsing Hua Yuan. Since then the Physical Director has arrived; five men and one lady from the U. S. A. have been added to the teaching staff; while three ladies and two men have left the school.

The preparatory school, now known as Tsing Hua College, is situated about four miles outside the northwest city gate (Hsichihmen) of Peking on the line of the Peking-Kalgan Railroad. It is beautifully environed amidst rural surroundings in sight of the new Summer Palace, and almost adjacent to the magnificient ruins of the Old Summer Palace (Yuen Ming Yuen). It has been stated that this site was originally occupied as the country residence of the notorious Prince Tuan of "Boxer" fame, and that after his downfall the old Empress-Dowoger confiscated his property and turned it over to the Wai Wu Pu, for the use to which it is now being put. Others question this and affirm that the Park was originally the property of Prince Tun, the fifth son of Tao Kuang. In fact the local name for the place has long been Wu Ye Yuan, which means the "Park of the Fifth Prince."

When the Park was handed over to the Bureau of Educational Mission to the United States by Imperial Edict issued at the instance of the Prince Regent in 1911 the Tsing Hua College was at once laid under the direction of the then Vice-Minister of Foreign Affairs, Mr. Chow Tze-chi, who was once Charge d'Affaires in Washington. The late Mr. Tong Kaison, who was eventually President of the College, and Mr. Y. L. Fang, afterwards Minister of Education, co-operated with Mr. Chow Tze-chi in this work, and as a result of their efforts a number of buildings were erected in 1910 and 1911 sufficient to accommodate 600 students, the contract being carried out by Mr. Emil S. Fischer, formerly of New York and now head of Fischer and Co. of Tientsin and Peking. The cost of the work was over half a million Taels, or about $350,000 gold dollars.

A well built stone wall completely surrounds the 60 odd acres which make up the College Compound, which will be improved as soon as necessary funds are available. The College has recently acquired 60 more acres to the west. The Compound is attractively landscaped with artificial tree-topped hills, lotus ponds, and a small stream which runs directly through it. A considerable number of trees have been planted, a greensward laid out, and many flowers placed on the hillsides. The buildings of foreign, semi-foreign and Chinese architecture are conveniently grouped in the Campus. The offices of the Bureau of Educational Mission to U. S. A. were originally housed in the reconstructed Yamen, strictly Chinese in every detail, picturesquely surrounded by low hills and opening at the rear on to a marble porch which overlooks a lotus pond. There are substantial residences for the President of the College, the Dean, and a small Compound for the Chinese teachers, now numbering sixteen. The American teachers have had nine double bungalows allotted for their use, one of which has been comfortably fitted up as a Club House.



Entrance to "Yamen" of Bureau of Educational Mission to U. S. A. and in background the Compound for the Chinese teachers, Tsing Hua College

The High School department occupies a large two-wing double story grey brick building. This contains the educational office, offices for the President and Dean, an attractive Faculty room, the Chemical and Physical Laboratories, and various class rooms. Behind this building is an Assembly Hall which will accommodate about 400. Adjoining this at the rear are the High School study-halls, dormitories and dining room—all one story brick buildings connected by covered corridors. At the west end of the dining room a workshop for Manual Training has been fitted up, the boys of the third and fourth year Middle School and first year High being required to take this subject.

The Middle School is housed in a group of buildings separated from the High School by a small stream bridged in three places. It comprises class-rooms, Proctors' and Secretaries' Offices, the beginning of a Museum collection, study-halls, dormitories, dining-room, kitchen, and out-buildings. These are all connected by covered passage-ways. Suitable bath and toilet arrangements have also been provided. Just west of the Middle School is a well laid out athletic field, tennis courts, basket ball grounds, football and baseball field, running track and space for field events, and an archery area. Athletics have now become compulsory for every student. He must take regular calesthenic exercises each morning as well as spend one hour daily in some out-of-door sport. Careful account is kept of attendance and credit allowed for the athletic work. Beyond the athletic field is a Hospital and Dispensary building.

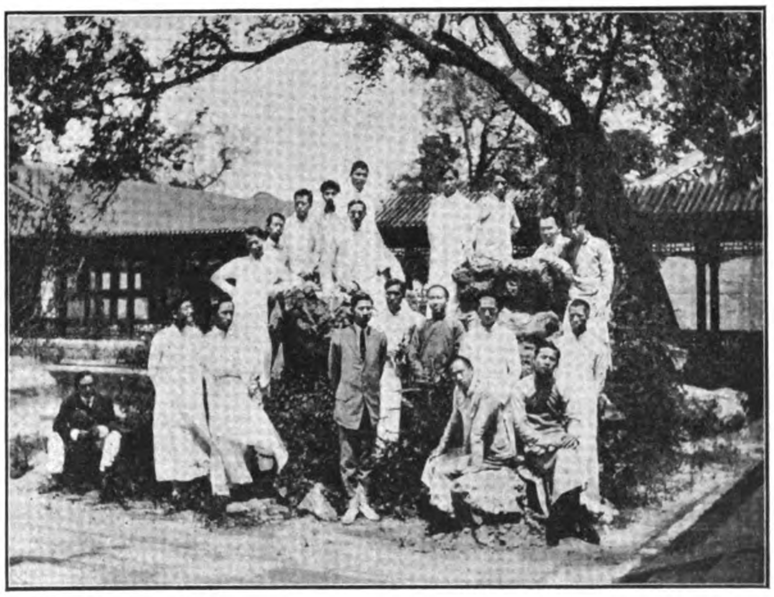


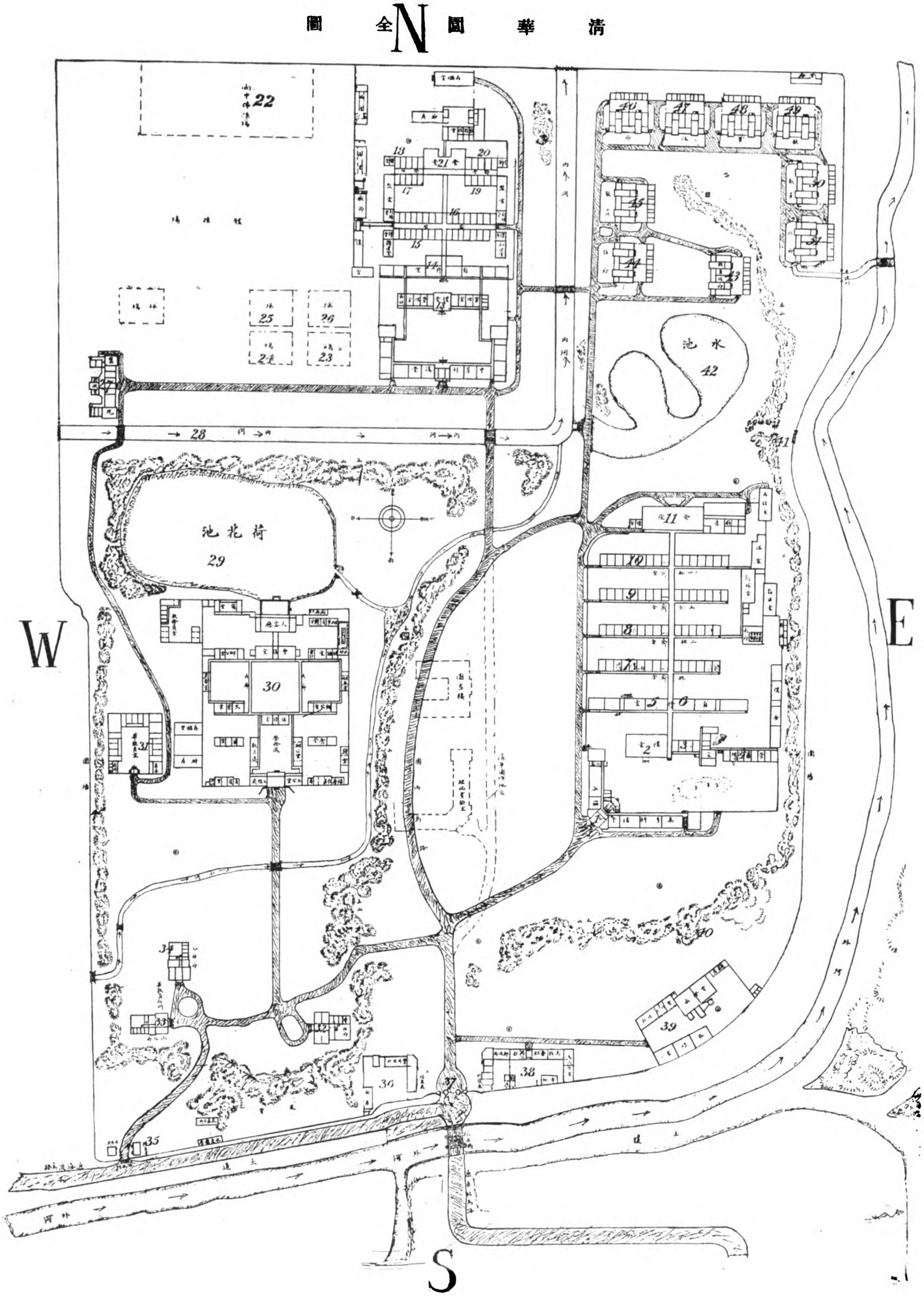
Photo by C. B. Malone
Group of High School Students at Tsing Hua College.

Every student is given a complete medical inspection and physical examination upon entrance to the College, and further examinations are required throughout the year. Special attention is given to Preventive Medicine and Hygiene. Plans have been considered for a Gymnasium, a Library and a Science Building, and these will probably be erected in due time. The entire plant is well lighted with electricity, and telephone connections have been established with Peking.

After considerable delay and uncertainty Tsing Hua College was formally opened with Chinese ceremonies on April 1st, 1911. The High School Department was begun with 128 advanced students who had failed in their previous examinations to be selected to go to the U. S. A. 307 younger students were selected by the Provincial examiners, ostensibly upon competitive examination to enter the Middle School. Practically every Province in China, besides Manchuria and Mongolia, was represented in the School. After a complete physical examination the boys were allowed to take up residence. The teaching of the younger students was at first almost completely in the hands of Chinese teachers who then numbered about twenty. The American teachers were assigned, rather arbitrarily, to teach the older boys, from among whom it was understood that fifty would be selected that year to proceed to the United States.

The first Dean was a young man recently graduated from an American College of high standing. His record as a student had been exceptionally good, especially in mathematics, but he lacked executive ability and had no real experience in school organization. It was evident from the first that this inexperienced dean was not going to coöperate with the American Faculty, nor plan the College work in such a manner as to inspire their confidence. In the outline for the first curriculum mathematics overbalanced everything else; in fact it crowded the study of English almost to second place. A foolish attempt was made to introduce a course in Esperanto; in fact the Dean at first succeeded in dubbing the new institution, "La Kolegio de Juna Hinujo." After trying in all tactful and courteous ways to obtain from the Dean some idea of what he was attempting to accomplish the American teachers felt it their duty to offer the following suggestions:—

"1st. That the curriculum be adapted to meet the requirements for



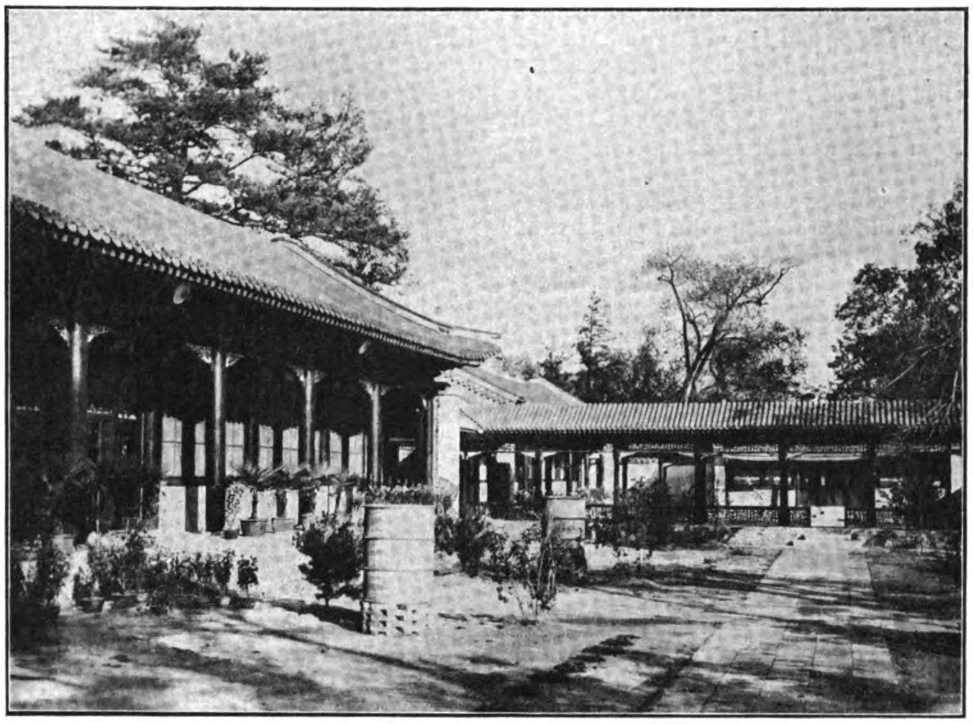
Plan of Tsing Hua College (See Key on page 369.)

entrance to American Colleges." (Up to this time there had been but little indication that this was being done).

"2nd. That the students be informed as soon as possible in regard to the above requirements." (Heretofore there had been great doubt and uncertainty).

"3rd. That immediate steps be taken to thoroughly prepare as many as possible of the advanced students for entrance to American Colleges next fall." (The policy of the Dean had seemed to thwart this very purpose).

"4th. That the teachers be kept in close touch with the educational plans and workings of the School." (Up to that time no faculty meetings had been held. The Regulations of the school were made out in Chinese largely by the Dean himself, and it was only after considerable pressure that translations were given to the American teachers. The Dean undertook to organize all the teaching work without consultation with the teachers, and assigned courses which were very illy balanced.)



The Central Court of "Yamen" of Bureau of Educational Mission to U. S. A., Tsing Hua College.

Following closely upon these recommendations the Dean "resigned of his own accord." The Directors then realized that the welfare of the new school depended upon the selection of a capable successor who could command the respect of the American faculty. Great tact and wisdom was shown in their next move. Mr. Chang Pe-ling of Tientsin, a man of rare personal traits, an avowed Christian gentleman with marked ability for educational work, was persuaded to give a portion of his time to help reorganize the educational scheme. He was formally appointed Dean by the Directors, and immediately began by making a thorough survey of the whole College. He met all the teachers personally, and secured from them suggestions as to necessary steps to be taken to place the work upon a sound educational basis. In many ways pains were taken to inspire confidence that the new regimen would conserve the purpose for which the school was established.

The American teachers were requested to present recommendations as to the best method of selecting students to go to the United States. They replied, "We have come to the conclusion that the most important thing now before us is the formulation of proper and just plans for determining upon the students to be sent to the United States this summer. We would suggest that in considering the qualifications of students for entrance into American colleges the following features are of the greatest importance, and will result in the best selection, namely, 1. Past records of scholarship. 2. Present class standing, and 3. A fair general examination. After due consideration the Directors announced that the advanced students would be chosen on the basis of 50% being allowed for their class standings and 50% on a final examination in college entrance requirements. The examinations took place at Tsing Hua College from June 23rd to 29th inclusive. The examination questions were set by the Faculty, and the examination conducted by Bureau officials in a very thorough manner. The questions, on the whole, were about the same as those set for entrance into the best American colleges. The papers were graded by Chinese scholars, most of whom were returned students from America who held important positions of trust inPeking.

From the 134 advanced students taking this examination, 63 were chosen to go to the Unites States. With few exceptions these were the best prepared students in the College. The American teachers were satisfied that every effort was made to pick students best qualified to go, although it was felt considerable improvement could have been made in the preparation of some of them had they remained longer in the school. Three of these boys were detained on account of their physical condition; each student being required to pass a rigid physical examination before being allowed to proceed to the States. The successful ones sailed from Shanghai on the s.s. "Persia," August 5th, 1911. They were placed in the leading colleges of the Middle and Eastern States.

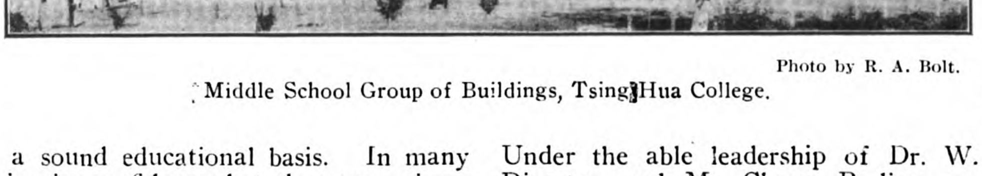


Photo by R. A. Bolt.

Middle School Group of Buildings, Tsing Hua College.

At the opening of the College Mr. Tong Kaison was away on a Mission to America and Europe and was compelled to be away during the uncertain months of preliminary organization. Mr. Chow Tze-chi was commissioned to go to the Coronation in England at a most critical time in the initial period of organization. Under the able leadership of Dr. W. W. Yen, then Acting-Director, and Mr. Chang Po-ling as Dean the policy of the College began to assume definite shape and gave promise of conserving the ideals for which it had been founded. Shortly after Mr. Tong Kaison and Mr. Chow Tze-chi returned a reorganization of the Bureau of Educational Mission to the

U.S.A. took place. This was further effected after the Revolution. Mr. Chow Tze-chi was appointed to the Governorship of Shantung; Mr. Fan Yuen-lien became Minister of Education; Mr. Chang Po-ling withdrew to concentrate upon his work as principal of Nan Kai Middle School; Mr. Tong Kaison was elevated to Director and President of Tsing Hua College, and in April, 1912, Mr. Y. T. Tsur received the appointment of Vice-Director and Dean. Mr. Tsur came to his new work with high ideals and a determination to place the educational scheme of the College on a firm basis. Mr. Tong Kaison worked heroically for the school during the trying period of the Revolution and afterwards in getting sufficient funds to keep it going. Even when confined to his bed with a fatal heart disease his interest in the College never fagged, and until the last he was planning for its welfare. After his death in August, 1913, Mr. Y. T. Tsur, then in the United States with the 20 students he had taken to place in the colleges, was appointed President of the College, and recently Mr. G. T. Chao, a graduate of Wisconsin University, has been appointed Dean. Everything now points the way for a bright future for Tsing Hua College. The new officials give promise of conserving what was best in the fundamental policy of the institution and of adding necessary new blood to meet new conditions.

Tsing Hua College as now reorganized consists of two departments—a High School and a Middle School. The Middle School receives boys from 11 to 13 years who have been selected by the Provincial Educational authorities. In this school they are early led into studies taught in the English language, and by the time their four years are finished they are able to take practically all work in English in the High School. The High School gives a College preparatory course leading either into scientific or general literary work. It aims to so thoroughly prepare the students that they may enter the American colleges and universities without conditions, or without any further preparatory studies. Some of the recent graduates have been able to enter the Sophomore year in several of the American colleges. Practically the entire last batch of 20 students were able to enter without condition the best institutions of the Middle and Eastern States. In the United States they are allowed to pick the college suited to their purpose and are given from four to six years to complete their course. All the expenses while in the Tsing Hua College, and in the United States, are met from the returned "Indemnity Fund." In the United States a Director and a Secretary for keeping in intimate touch with all the Chinese students are maintained at Washington. At present Mr. T. T. Wong is Director and Mr. Chung Wen Ough Secretary for the Chinese students in the United States.

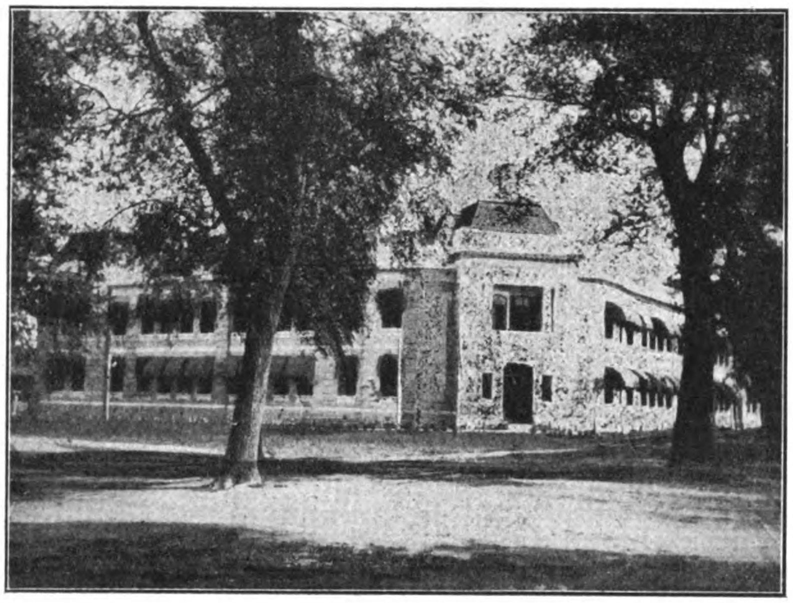


Photo by C. B. Malone.

Front View of Main High School Building, Tsing Hua College.

This educational scheme, and similar ones, force us to the question, "What will be the outcome of modern scientific education in China, and especially the influence of American education upon the new generation of students?" Confused answers are already being given to this question. A vigorons writer in the *Edinburgh Review*, just before the Revolution, surmised that, "America was desirous, for motives that can be guessed, to attract Chinese students, and the Chinese Government had a particular reason for sending them to a country that was going so fast ahead in the van of progress. The result, however, has been to stimulate the same kind of unrest that is troubling India.............. Thus the constitution of the Celestial Empire, the oldest in the world, is disordered by a few doses of the new learning." After a few more well-turned sentences this same writer bubbes over with, "We cannot wonder that the venerable despotism of China should have been painfully discomposed by the rapid absorption of American stimulants." This critic certainly had some ground for his fears, but in all fairness he should have differentiated those students returning to China from American colleges and those educated elsewhere. The returned students from the Yung Wing Educational Mission brought back to China new and vigorous life and introduced here many of the modern reforms. We need not plead for such men as Y. C. Tong, Jeme Tien-yu, Tong Shao-yi, Tong Kaison, Tsai Ting-kan, Liang Tun-yen and Liang Ju-hao.

Many of the younger generation of returned students have also acquitted themselves creditably. A Chinese gentleman who really knows the facts states the case thus: "In various ways our American educated men and women are leaving their impression on our national life. They are giving a good account of themselves, they are reflecting credit on the country from which they drank inspiration, and they are setting us a worthy example of serious and efficient service." In another place Y. T. Tsur has compiled a list of above 100 returned students from the United States together with their colleges in the States and occupations in China. This shows them to be largely influential on Government Boards, as educators, editors, physicians, engineers, etc., etc. Whatever may be the ultimate outcome of this Western education, it is at present true that the educated Chinese youth are earnestly seeking opportunities to go abroad and find out for themselves. We cannot at present stem the tide. Our real responsibility is to give them the best we have—the most fundamental moral, mental, and physial education we have, and not a superficial gloss of Western materialism. While we cannot pass any final judgment upon this recent educational movement, it is certain that if the new learning is introduced into China with moral earnestness it will be the greatest factor in the uplift of this virile people.

OUTLINE OF COURSES OF STUDY AT TSING HUA COLLEGE FOR 1913-14.

Middle School. 1st Year.	Hours per week.	High School. 1st Year.	Hours per week.
Chinese	10	Chinese	3
Reading	5	Reading	4
Grammar & Sentence	3	Rhetoric and Composition	3
Dictation	2	General History	3
Penmanship	1	Elementary Chemistry	3
Nature Study	3	Physiology	3
Arithmetic	3	Plane Geometry	3
Drawing	2	Ethics (Lectures)	1
Music	2	Music	1
Health Drill	1	Health Drill	1
		Manual Training	2
		Elementary Physics	2
	32 hours.		29 hours.

One hour daily required of all students on Athletic Field.

2nd year.		General Course.		Scientific.
Chinese	10	Chinese	3	3
Nature Study	3	English Lit.	6	6
Reading	5	Modern Language	5	5
Grammar & Sentences	3	Ancient History	4	4
Dictation	2	Ethics (Lectures)	1	1

Conversation	1
Arithmetic	3
Drawing	2
Music	2
Health Drill	1
	32 hours.

	General	Scientific
Health Drill	1	1
Music	1	Elective subject 1
Solid Geometry and Trigonometry	4	Required 4
Elective. Latin (Elective)	5	Mechanical Drawing 2
Second Modern Language	5	Manual Training 2

3rd Year.

Chinese	6
Reading	5
Grammar & Sentence	4
Dictation	2
Conversation	1
Geography	3
Algebra	3
Drawing	2
Manual Training	2
Music	2
Health Drill	1
	31 hours.

	General Course.	Scientific
Chinese	3	3
English Literature	3	6
Modern Language	5	5
Mediæval & Modern History	4	4
Higher Arithmetic	1	1
Ethics (Lectures)	1	1
Health Drill	1	1
Elective Subjects.		Advanced Algebra 4
Latin (2nd Year).	5	Chemistry 5
2nd Modern Elective subject. Language	5	Music 1
Advanced Algebra.	4	
Advanced Physiology	3	

Middle School — 4th Year.

Chinese	6
Reading	4
Grammar & Rhetoric	3
English Composition	2
Conversation	1
General Geography	3
Elementary Chemistry	2
Hygiene	1
Algebra	3
Manual Training	2
Drawing	1
Music	1
Health Drill	1
	30 hours.

High School

	General Course.	Scientific
Chinese	3	3
English Literature	5	5
American History	4	4
Civil Government	2	2
Political Economy	2	2
Ethics (Lectures)	1	1
Health Drill	1	1
Theme Writing	2	Physics 5
Public Speaking	1	
Electives	3	Electives
Psychology. Logic	2	Chemistry 5
Second Modern Language. 3rd year	5	5
Analytical Geometry	3	3
Mathematical Survey	2	2
		Music 1

Statistics of the Bureau of Educational Mission to U. S. A. for 1913.

Tsing Hua College

Number of Chinese Teachers 16
Number of American Teachers 18

Number of Students in Tsing Hua College November 20, 1913.

High School		Middle School	
Senior Class	36	4th Year	56
Junior „	45	3rd „	50
Sophomore Class	37	2nd „	44
Freshman „	56	1st „	72
	174		222

Total number of students .. .. 396.

Number of Students in the U.S.A. on the "Indemnity Fund"

1st Batch	47
2nd „	70
3rd „	60
4th „	19
	196

Students taken over on the "Indemnity Fund" as Specials.

Chinese Legation Students	3
Sent by Board of War	2
Sent by the Customs College	2
Sent by the Peiyang College	14
Special Scholarship Students	9
	30
$500 gold—Scholarship Students	32
Girl students taken on to the Fund	4
	36

Total Number of Indemnity Students .. .. ..272.

Total Number of Chinese Students now in the U. S. A. is about 1,000.

Key to Plan of the Tsing Hua College Buildings

No. 1:—The Main College Building with upper story, of imposing architectural construction, with class rooms, lecture rooms, chemical studies, presidential and secretarial reception and office rooms, all laid out for over 300 students.

No. 2:—The Li Pai Tang, or festival hall, as well as music study for the students, seating capacity about 400, good acoustic, and airy hall.

No. 3:—Adjoining the Festival Hall the quarters for the Business Manager of the College and Proctor.

No. 4:—The temporary Library.

No. 5:—The Students' rooms in which the students do their preparatory work.

No. 6:—Ditto (both 5 and 6 are for the High School only).

No. 7, 8, 9 and 10:—Dormitories for 300 High School students.

No. 11:—The Large Dining Hall for the east section of buildings with its kitchen, and pantry; part of this dining room is now used as the study room for manual labour.

No. 12:—The Grammar School class rooms.

No. 13:—A small hall with adjoining offices.

No. 14:—The Studies.

No. 15 to 20:—The dormitories for 300.

No. 21:—The Dining Hall of the Grammar School students and adjoining kitchen and other buildings.

No. 22 to 26:—The Sport and Athletic field with tennis courts, basket ball grounds, etc.

No. 27:—The Hospital building in charge of Dr. Bolt.

No. 28:—The 'Inner River.'

No. 29 to 42:—Lotus Ponds.

No. 30:—The old Princely Residence, now generally called "the Yamen" all reconstructed and with fine Great Halls and living quarters of the officials of the College; here is also the central telephone station which connects the three million square feet of extended property of the Tsing Hua College and its various buildings, as well as offices.

No. 31:—The Chinese Teachers' residential quarters.

No. 32, 33, 34:—The Residential Houses for the President and Vice-Presidents of the College.

No. 35:—The South West Entrance (closed).

No. 36:—The College Grounds Police Head Quarters.

No. 37:—The Main Entrance Gate (Archway) with road to the Peking-Kalgan Railway Station, which is ten minutes off.

No. 38:—The Post-office and Porter Quarters, as well as stables.

No. 39:—The Electric Light station giving current, for 2,000 electric incandescent lamps.

No. 40 and 41:—The wooded hills in the old Princely Park.

No. 42:—Lotus Pond.

No. 43:—The Club of the American Professors and Teachers.

No. 44 to 51:—The Residential Buildings and section of the homes of the American teachers engaged by the Tsing Hua authorities directly from the States Each building has a double residential section with sunny rooms and verandahs, Dining and Sleeping Rooms and Parlor. Most of these buildings face the pretty panorama of the Western Hills, with the Great Summer Palace in front, the Precious Stone Pagoda, and so on.

PHILIPPINE LUMBER CONCESSION

The Governor-General of the Philippines has granted to the Kolambugan Lumber Company a concession to cut two billion feet of merchantable lumber in the Moro province, the concession to run for twenty years. The area comprises 100 square miles and the capital is furnished by the Millars Karri Lumber Company, the largest firm of lumber dealers in the United Kingdom, which has for many years had huge lumber concessions and holdings in the south-western part of Australia.

THE HWAI RIVER CONSERVANCY SCHEME

TEXT OF THE AGREEMENT

The following is the text of the Memorandum communicated on January 30 last by the Chinese Government to the American Red Cross Society:—

Hwai River Conservancy Memorandum addressed by the Government of the Republic of China to the American National Red Cross, or its representatives, or successors.

I. In consideration of the interest already practically manifested by the American National Red Cross in the Hwai River region, and in consideration of the readiness of that organization and its representatives or successors to take steps with a view to obtaining the funds for carrying out the engineering works of the Hwai River Conservancy,

II. The Government of the Republic of China engages itself to allow the American National Red Cross, or its representatives, or successors, a period of one year from date for the purpose of preparing and effecting a Hwai River Conservancy Loan. The amount of this Loan is to be Twenty Million Gold Dollars ($20,000,000), or such sum as may be found necessary, after complete surveys have been made, to carry out the work of improving the water courses embraced in the Hwai River district, including the Hwai River from Hsin-yang-chow, in Honan, passing through Hsi-hsien, Hou-ch'iu-hsien, Feng-t'si-hsien, Huai-yuan-hsien, Wu-ho-hsien, and Yu-i-hsien, the Inner Grand Canal, the Yi, Ssu, and Shu Rivers, in the province of Kiangsu, the Sui, Ko, Fei, K'uai, Ch'ung, T'ung and T'o Rivers, in the province of Anhui, and the Hungtzu Lake, together with the contemplated outlets to the sea and the Yangtze River. If after the above conservancy work has been in progress for some time, it shall appear that the original loan is insufficient to provide for its completion, then, after complete investigations as to the requisite amount have been made by the Engineer-in-Chief, the Director General of the National Conservancy Bureau, upon approving the report submitted by the Engineer-in-Chief, shall approach the American National Red Cross, who will continue to use their good offices for increasing the loan, on terms mutually satisfactory at the time of such increase, to such an amount as will render possible the completion of the Hwai River Conservancy works as herein delimited.

III. The Loan shall be a Government of the Republic of China Gold Loan, bearing interest at the rate of five (5) per cent. per annum and shall be secured as follows:

(a) All government revenue derivable or now derived from government lands in the Conservancy Area as defined in Article II. and Appendix A, and also all additional revenues which may in the future accrue to the Government of the Republic of China as a result of the conservancy work, which shall include revenue from the sale or lease of reclaimed lands, as well as special conservancy, taxes, to be levied by the Government of the Republic of China on all lands benefited by the Conservancy work; also all tolls levied for the use of the Grand Canal within the Conservancy Area.

(b) Should the above revenues and taxes derived by the Government of the Republic of China be insufficient to meet the payments of the interest and principal of the loan when they fall due, the Government of the Republic of China undertakes to repay in full both principal and interest on their due dates, with revenue derived from other sources.

IV. The issue price of the bonds shall be fixed by agreement between the Government of the Republic of China and the American National Red Cross, or its representatives, or successors, in accordance with the most favourable market price of the similar obligations of the Government of the Republic of China, such as bonds for railway construction, at the time of signing the loan contract. The price payable to the Government of the Republic of China shall be the actual rate of issue to the public less an equitable amount for bankers' commissions, flotation charges, and stamps.

V. The Government of the Republic of China expresses its desire to trust the American National Red Cross to secure an engineer of ta east five years' experience in the United States in river conservancy work of the first magnitude and of the highest professional reputation, for the post of Engineer-in-Chief of the Hwai River Conservancy work, who shall be entrusted with the preparation of definitive plans for the engineering work and shall be in charge of all the works in the Conservancy Area as defined in paragraph II and delimited in Appendix A. As an evidence of its good intention to assist the Republic of China the American National Red Cross shall designate for appointment by the Government of the Republic of China, an engineer possessing the qualifications desired by the Chinese Government as stated above. In order to give evidence of American fairness and strengthen the confidence felt in the Chinese Government any consulting engineer representing the Director General of the Nationa, Conservancy Bureau who shall be under orders to inspect the progress of the works of the Hwai River Conservancy and the other conservancy works in the Conservancy Area as delimited in Appendix A, shall be afforded reasonable facilities for such inspection, in the same way that he is assisted in the inspection of all the other works undertaken by the National Conservancy Bureau.

VI. The construction work shall be carried out under a percentage contract, and the construction company selected to carry out the work shall have the approval of the Government of the Republic of China and of the American National Red Cross, or its representatives or successors All sub-contracts of a nature to be specified in the Final Agreement, which may be let out by the Construction Company for the prompt prosecution of the work, are to be made on the basis of public tender.

VII. If within the Hwai River Conservancy Area there are engineering works of lesser magnitude that, either from the standpoint of conservancy or water communication, demand immediate action and necessitate the preliminary advance of one or two million dollars gold, then the American National Red Cross, or its representatives or successors, actuated by a friendly purpose to assist China, agrees to use its good offices, after receiving the representations of the Government of the Republic of China, to secure at the earliest possible moment an advance to the amount required, said advance to be repaid from the large loan when made.

VIII. All arrangements for the efficient handling of disbursements and receipts and for the mutual protection of the Government of the Republic of China and the bondholders shall be settled by negotiation and embodied in the Final Agreement. General lump sum appropriations from the proceeds of the loan must first receive the sanction of the Director General of the National Conservancy Bureau but all payments made therefrom shall be made only upon joint approval by the Managing Director and the Engineer-in-Chief.

IX. As soon as possible after the signing of this Memorandum the two parties shall appoint delegates with full powers to negotiate and conclude a Final Agreement subject to the approval of theirprincipals. When the expiration of the time covered by this Memorandum has arrived should either party thereto be unable to fulfil its engagement it shall become of no effect.

X. The English and Chinese texts of this Memorandum have been carefully compared; but in the event of there being any difference of meaning between them, the sense as expressed in the English text shall be held to be the correct one.

Appendix A.

The Hwai River Conservancy Area shall include the following water courses, together with such subsidiary works as according to the final plans of the Engineer-in-Chief shall be necessary for the proper working of the whole system:

HWAI RIVER

Starting from Hsin-yang-chow, in Honan, it proceeds through Hsi-hsien, Hou-ch'iu-hsien, and Feng-t'ai-hsien to Huai-yuan-hsien, uniting the following rivers: Sui, Ko, Fei, K'uai, Ch'ung, T'ung, and T'o: it passes through Wu-ho-hsien and Yu-i-hsien, to the Hung-tzu Lake; it subsequently passes through Ch'ing-ho-hsien and An-tung-hsien to the sea.

INNER GRAND CANAL

Starting from Kua-chow on the Yangtze it proceeds to Ch'ing-ho-hsien and joins the Grand Canal.

YI RIVER

Starting from Ch'i-ts'un it proceeds to Yao-wan, where it enters the Grand Canal.

SAN RIVER

(Also called the Pu-lao River)

Starting from Lin Chiao Pa it goes to a place between Yao-wan and Hsu-t'ang, where it enters the Grand Canal.

SHU RIVER

Starting from Ta San Ch'a K'ou it goes eastward to Chou Chia K'ou, where it enters the Lin T'ang River.

(This portion is known as the "Ch'ien, Anterior, Shu River.")

Arriving at Lung Wang Miao it makes a turn to the North and proceeds to Ma Chia K'ou and enters the Ch'ing Yi Lake. (This portion is known as the "Hou, Posterior, Shu River.")

For purposes of the security for the loan under paragraph III, the area shall also include the entire drainage area of the above mentioned water-courses.

Signed at Peking, China, this thirtieth day of January, one thousand nine hundred and fourteen:

Accepted on behalf of the American National Red Cross.

Signed: PAUL S. REINSCH.

Envoy Extraordinary and Minister Plenipotentiary of the United States of America

For the Government of the Republic of China.

Signed: (In Chinese by CHANG CHIEN)

Seal of the Ministry of Agriculture and Commerce. Seal of CHANG CHIEN as Director-General of the National Conservancy Bureau

MINING IN THE PHILIPPINE ISLANDS

"The noteworthy features of the mining industry in the Philippines during the past," says Mr. Warren D. Smith, in his review of the mineral resources for the year 1912, "are the signal success of the Colorado mine in Masbate, a gold-quartz property; the installation and very successful operation of the Gumaus gold dredge on the river of that name in the Paracale district; the erection of a small, but modern, cupola for iron smelting in the Angat iron region; the highly successful utilization of Philippine coal in a gas producer at the Bureau of Science and the completion of a geologic survey of the lower end of the Bondoc Peninsula, Tayabas Province, a district which is already well-known on account of its seeps of exceptionally high-grade petroleum.

FOUR DREDGERS AT WORK

"That branch of mining devoted to the winning of gold has been very active, and shows very promising results. Besides the marked success of the Gumaus dredge already mentioned, there are three other dredges operating in the vicinity of the Paracale River, with two more building, and a third is scheduled to begin operations on the lower Umirai River in September of this year (1913). The flotation of the Cansuran Placer Company for hydraulicking the goldbearing gravels on the river of the same name focuses attention once more on the Surigai Peninsula, long well-known as being fairly rich in gold. The thorough resuscitation of the promising mineral district of Masbate is indicated by the beginning of the erection of mills for the Eastern and Keystone properties. The Benguet district remains in a badly crippled condition, and, with the exception of the Headwaters mine and the Camote mines which are still (June, 1913) running operations are practically at a standstill. An increase for the year of nearly a million pesos in gold production in the Archipelago is a remarkable showing in the early stages of the industry. It means much more now than were it simply another million added to a production of several millions already existing. Those who have been the most active, the promoters and operators, have a right to feel proud of their efforts.

NO SUCCESSFUL COAL MINE

"During the past year, the East Batan coal mine, which had been operating fairly continuously for five years, went into the hands of a receiver and was eventually sold to the Government to satisfy its preferred indebtedness. With the exception of a little grubbing by the natives and some exploratory work in Cebu, there is nothing further to be said about the coal industry. It seems to be peculiarly strange that with so much coal occurring in the Archipelago no successful mine has been started.

"In copper there is nothing new to be noted, although there seems to be a renewed interest, judging from the requests for information.

"The most important field work carried on by the division of mines, of the Bureau of Science during the past year has been the geologic survey of the Bondoc Peninsula, Tayabas. The structure of the region appears to be very favorable for the accumulation of commercial quantities of petroleum, and plans are being projected leading to exploration of the field by drilling.

WOLFRAMITE DISCOVERY

The discovery of the mineral wolframite has been reported from Antique Province, Panay. A specimen in the provincial exhibit of Antique at the last Philippine Exposition proved to be wolframite, and thus tends to confirm the reports.

A deposit of gilsonite, one of the mineral pitches, in a vein about 6 meters wide, is reported as having been found in Leyte. Samples of this substance, collected by persons of undoubted good faith, have been received at this office.

What may prove to be large deposits of chromic iron and copper have been located in Antique Province, Panay.

The successes and failures of the past year, as well as of preceding years, have clearly demonstrated:

First, that this is not a mining country for a poor man and that any gold rush or any other kind of a mining boom would lead to a great number of bitter disappointments.

Second, the superiority of careful investigation by technically trained men to the guess work and "rule of thumb" methods of many so-called "practical miners."

Third, that there is a legitimate mining industry here which, if properly fostered, will yield in time a large return both to private investors and the Government.

REFORM OF CHINA'S CURRENCY

The National Currency Law for China was promulgated by Presidential Order on February 7. Some slight alterations were made in regard to the weight of the subsidiary silver coins.

The following is the weight and fineness of the coins according to the law as promulgated:—

1. One *yuan*, gross weight 72 candareens with 90 per cent silver and 10 per cent copper.
2. 50 cent piece, gross weight 36 candareens with 70 per cent silver and 30 per cent copper.
3. 20 cent piece, gross weight 1.44 candareens, with 70 per cent silver and 30 per cent copper.
4. 10 cent piece, gross weight 7.2 candareens with 70 per cent silver and 30 per cent copper.
5. 5 cent nickel piece, gross weight 7 candareens with 25 per cent nickel and 75 per cent copper.
6. 2 cent copper piece, gross weight 28 candareens, with 95 per cent copper, 4 per cent pewter and 1 per cent lead.
7. 1 cent copper piece, gross weight 18 candareens, with its fineness same as 2 cent copper piece.
8. 5 li copper piece, gross weight 9 candareens with its fineness same as above.
9. 2 li copper piece, gross weight 4.5 candareens with its fineness same as above.
10. 1 li copper piece, gross weight 2.5 candareens with its fineness same as above.

THE ADMINISTRATION OF THE SALT GABELLE

TEXT OF THE REGULATIONS

The regulations regarding the Chief Inspectorate, the District Inspectorates and the Advisers to the Salt Administration of China have been promulgated. We give a translation of the text:—

Regulations for the Chief Inspectorate of the Salt Administration

Art. I.—These regulations are drawn up in accordance with the provisions contained in Article V of the Chinese Government Reorganization Loan Agreement, signed on April 26, 1913. All officials in the Salt Gabelle and subordinate departments shall observe them.

Art. II.—As stipulated in Article V of the Reorganization Loan Agreement the Chief Inspectorate shall form an integral part of the Central Salt Administration.

a—In the Chief Inspectorate there shall be one Chinese Chief Inspector and one Foreign Associate Chief Inspector. The post of Chinese Chief Inspector shall be held by the Head of the Central Salt Administration, and the post of Foreign Associate Chief Inspector shall be assumed by the Adviser of the Central Salt Administration. When the Associate Chief Inspector is on leave, or absent from duty, the Deputy Associate Chief Inspector shall act both as Associate Chief Inspector of the Inspectorate and Adviser to the Administration.

b—The Chinese Chief Inspector, and the Foreign Associate Chief Inspector shall supervise the issuing of licenses and the compilation of reports and returns of revenue.

c—With the exception of the Chinese and Foreign Chief Inspector, and the Deputy Associate Chief Inspector, who shall be appointed by the Minister of Finance, all other members of the Chinese and foreign staffs in the Chief and the District Inspectorates shall be engaged or dismissed by the Chinese and Foreign Chief Inspectors with the approval of the Minister of Finance.

d—The funds as recorded in the Chinese Salt Gabelle shall only be drawn under joint signature of the Chief Inspector and Associate Chief Inspector.

e—All accounts of the receipts and disbursements of the Salt Revenue, including receipts and payments on account of the purchase, storage, transportation and sale of salt on behalf of the Government shall be audited by the Chief Inspectorate, who shall publish quarterly reports of such receipts and disbursements after submitting them to the Minister of Finance for approval.

f—The protection of the priority of the several obligations secured upon the salt revenues shall be the duty of the Chief Inspectors.

Art. III.—In addition to the duties described above the Chief Inspectorate shall control the District Inspectors in the discharge of the duties as defined in the regulations for the governing of District Inspectorates.

Art. IV.—In discharging the duties described in the foregoing articles the Chief Inspector and the Associate Chief Inspector shall be subject to the direct control of the Minister of Finance.

Art. V.—All orders of the Chief Inspector and Associate Chief Inspector shall be issued in the name of the Minister of Finance, under the seals of the Minister of Finance and the Chief Inspectors, and shall be approved by the Minister of Finance before they are issued.

Art. VI.—If disagreement arise between the Head of the Central Salt Administration and Chinese Chief Inspector and the Foreign Adviser they shall refer the matter to the Minister of Finance for decision.

Art. VII.—The Chief Inspectors shall have the right of appointing, dismissing and controlling the Chinese and foreign District Inspectors and the staff of the District Inspectorates, but before exercising these powers they shall have the approval of the Minister of Finance and the orders of appointment or dismissal shall be submitted to the Minister of Finance.

Art. VIII.—The Chief Inspectorate shall design the forms of accounts and tables for recording the different items of the receipts and payment of salt revenues and also forms for the receipts, licenses, certificates, vouchers, etc., to be used in the District Inspectorates, and shall submit them to the Minister of Finance for inspection.

Art. IX.—The duties of the Chinese and foreign District Inspectors shall be provided for in the regulations for the control of the District Inspectorates. The monthly salaries and travelling expenses of District Inspectors shall be regulated by the Chief Inspectorate and shall not be increased without the sanction of the Minister of Finance.

Art. X.—The Head of the Central Salt Administration may at any time examine the documents in the Chief Inspectorate and the Chief Inspector and Associate Chief Inspector may examine the documents of the Central Salt Administration whenever required.

Art. XI.—The number of the members of the staff of the Chief Inspectorate shall be decided by the Chief Inspector and Associate Chief Inspector with the approval of the Minister of Finance, and increase in either staff or salaries shall be made without the sanction of the Minister of Finance. Within the limits prescribed by the Minister of Finance the Chief Inspector and the Associate Chief Inspector shall have the power of appointing and dismissing members of the Chinese and foreign staff of the Chief Inspectorate. These powers may be exercised only after permission is given by the Minister of Finance and the names reported to him. A fixed monthly allowance for office expenses may be drawn by the Chief Inspectorate, the amount to be fixed by the Minister of Finance in accordance with requirements. At the opening of each fiscal year the Chief Inspectorate shall compile a Budget of current expenses required within the year and submit it to the Minister of Finance. At the end of each fiscal year a statement of actual payments during the year shall be compiled and submitted to the Minister of Finance for approval.

Art. XII.—All affairs of the Central Salt Administration not described in the foregoing articles or in the revised regulations which may be hereafter issued shall be conducted by the Head of the Central Salt Administration with the assistance of the Foreign Adviser. Copies of all orders issued by the Head of the Central Salt Administration except those on routine business shall be communicated to the Chief Inspectorate.

Regulations for District Inspectorates of the Central Salt Administration

Art. 1.—All the District Inspectorates shall be under the control of the Chief Inspectorate of the Central Salt Administration which is under the direction of the Ministry of Finance. The District Inspectors shall obey the orders and follow the direction of the Chinese and foreign Chief Inspectors in performing their duties.

Art. 2.—In accordance with Art. V of the Reorganization Loan agreement, a branch office of the Chief Inspectorate shall be established in each salt producing district. In this branch office there shall be one Chinese and one foreign District Inspector who shall be of the same rank and with equal authority and their duties are described as follows:—

a.—The Chinese and foreign District Inspectors shall superintend conjointly the issue of licenses or permits authorizing the transportation of salt on the payment of duty, and shall collect all duty, fees, and salt dues in places where the District Inspectorate is established. They shall also supervise the collection of all duty, fees and salt dues at other places. The officials employed to collect duty at such places shall be appointed by the Chief Inspector and shall be responsible to the District Inspectorate for the duty collected.

b.—The release of salt after the payment of dues in any district will be made upon producing the documents bearing the joint signatures of the Chinese and foreign District Inspectors or the seal of the District Inspectorate. The officials in charge of the weighing or the release of salt from the salt depots shall be the subordinate staff of the District Inspectorate. The District Inspectors and their subordinate staff in charge of the weighing and release of salt shall see to it that all the salt released from the depots is covered by a proper permit, that the duty has been paid in full, and that only the quantity stipulated is to be released. The District Inspectors shall inspect periodically the salt works and salt depots within their district. If the local Salt Commissioner or any of the staff at salt offices disregard any regulations, the District Inspectors shall report the matter to the Chief Inspectors, and any case of illegal manufacture or smuggling of salt from the licensed salt works or salt depots, which they may discover in the course of their inspection, shall also be reported to the Chief Inspectors. In places where salt is purchased, stored, transported and sold on behalf of the Government, the duties of the District Inspectors in connection with the purchase, storage, transportation and sale of salt, shall be fixed by the Central Salt Administration.

c.—The District Inspectors shall lodge all salt revenue collected in a Chinese Government Salt Revenue Account with the group banks or with the depository approved by the said banks, and their sums shall be reported to the Chief Inspectorate for comparison with the returns from the District Inspectorate of the quantity of salt issued and with the returns from the said bank of the amount of revenue received.

d.—The Chinese and foreign District Inspectors shall report in full all receipts and disbursements of the salf revenue to the local salt commissioners and to the Chief Inspectorate in Peking.

e.—The Chinese and foreign Chief Inspectors may decide jointly upon the appointment and dismissal of any member of the Chinese and foreign staff of the District Inspectorate with the approval of the Minister of Finance.

Art. 3.—The number of the staff in each District Inspectorate shall be determined from time to time in accordance with the amount of business transacted. The Chief Inspectors shall make a report of the details regarding the staff to be employed and submit it to the Minister of Finance for approval.

Art. 4.—The District Inspectors shall submit a statement to the Chief Inspectors in regard to any doubtful point concerning the matters described in Art. 2 of this regulation and ask for instructions and await the decision. In matters of supreme importance the Chief Inspectors shall consult the Minister of Finance and abide by his decision.

Art. 5.—Should there be any dispute between a District Inspector and a local Salt Commissioner, in regard to their respective powers, duties and responsibilities, the matter shall be submitted by the Head of the Central Salt Administration and the Chief Inspectors of the Chief Inspectorate for the decision of the Minister of Finance.

Art. 6.—All accounting forms for the receipts and vouchers, licenses, certificates, etc., used in the District Inspectorate shall be prepared in conformity with the designs and instructions issued by the Chief Inspectorate.

Art. 7.—The District Inspectorate shall prepare at the beginning of each fiscal year a budget of its expenditures and send it to the Chief Inspector who shall submit it with that of the Central Salt Administration to the Ministry of Finance for examination and compilation.

Art. 8.—When the District Inspectorate finds it necessary to make inquiries about any item of the salt revenue, the number of licenses issued or any matter connected with the administration of the revenue, the District Inspector may write and request the local Salt Commissioner to hand over the documents concerned for inspection or they may send officials to the head office after consulting him to inspect the documents there. When the Salt Commissioner desires to know anything about the District Inspectorate, he may request the District Inspectorate to do the same.

Supplementary Articles

Art. 1.—If there be any matter which has not been provided for in these regulations in regard to the duties of the Chief and District Inspectorates, or if there should arise any necessity in the future for revising the regulations, the Chief Inspector and the head of the Central Salt Administration shall submit the particulars of the same with their proposals to the Minister of Finance. The necessary amendments and additions will then be made and the revised regulations will be promulgated by the Order of the Minister of Finance.

Art. 2.—These regulations shall be effective from the day of their promulgation by the Order of the Minister of Finance.

Art. 3.—From the day of the promulgation of these regulations, the old regulations made by the Central Salt Administration Preparation Bureau shall be abrogated.

Regulations for the Appointment of A Foreign Adviser in the Central Salt Administration at Peking.

Art. I.—These Regulations are made in accordance with the Chinese Government Reorganization Loan Agreement signed in Peking on April 26, 1913, or on the same date and same month of the second year of the Republic of China, and in which it is provided that "The Chinese Government engage to take immediate steps for the reorganization with the assistance of foreigners of the system of collection of the salt revenues of China assigned as security for this Loan." As provided in the regulations for governing the working of the Chief Inspectorate, the Associate Chief Inspector, and during his absence from duty, the Deputy Associate Chief Inspector shall be the Adviser of the Central Salt Administration.

Art. II.—The duties and the authority of the said Adviser are defined as follows:—

1.—Before any reorganization is effected of the existing system of salt administration and before any contract is concluded or any orders of importance are issued regarding the salt revenue and the transportation of salt to different localities for consumption (the official transportation, merchant's transportation and transportation by the public at large being included) the said Adviser shall be consulted by the Head of the Central Salt Administration, and the nature of the decision to be arrived at and of the orders to be issued shall be determined by the Head of the Central Salt Administration in personal discussion with or in correspondence with the said Adviser. A copy of every order issued by the Head of the Central Salt Administration which do not fall within the scope of the duties of the Chief Inspectors shall be communicated to the said Adviser for information. In particular the Adviser shall be consulted in regard to—

(a)—The arrangements for the supply of salt for consumption in the different provinces and localities and reforms which may be necessary in those arrangements.

(b)—The methods of collection and deposit in the Chinese Government Salt Revenue Account of duties, dues and payments of every description connected with salt, and the expenditure connected therewith.

(c)—The arrangements for the purchase, storage, transportation and sale of salt on behalf of the Chinese Government and the relations which are to exist between the officers in charge of these arrangements and the District Inspectors and Chief Inspectors appointed under the loan agreement.

2.—From time to time the Minister of Finance may instruct or the Head of the Central Salt Administration may request the said Adviser to devise measures for the improvement of the Salt Administration.

3.—When any meeting is held by the Salt Administration to discuss questions with regard to the Salt Administrative work, the said Adviser may participate in the discussions.

4.—If so ordered by the Minister of Finance, the said Adviser shall visit different places to inspect the conditions of the Salt Administration. He is expected to exercise scrupulous care in the work of inspection or the discharge of duties, and at the end of a visit of inspection to each place he shall prepare a detailed report in duplicate, one copy to be submitted to the Minister of Finance and the other to be kept for reference by the staff of Central Salt Administration.

Art. III.—If the said Adviser and the Head of the Salt Administration are unable to agree on any point which is under consideration or discussion the matter shall be referred to the Minister of Finance for decision.

Art. IV.—All important orders and documents pertaining to the Salt Administration shall be sent to the said Adviser for perusal and for discussion when necessary with the Head of the Central Salt Administration.

Art. V.—Should the said Adviser wish to peruse any of the archives, documents and reports of the Central Salt Administration he may submit requisition for the papers required and the head of the Salt Administration will instruct the official in charge of such archives, etc., to produce them.

STANDARDIZED SYSTEMS OF ELECTRICITY FOR CHINA

We are in receipt of the following letter from the Secretary of the Electricity Standardization Committee of Shanghai:—

To the Editor of the FAR EASTERN REVIEW.

SIR,—At a recent meeting of the Engineering Society of China it was decided to appoint a committee to consider and discuss the question of the standardization of system or systems of electricity supply in China with a view to placing recommendations before the proper Government authorities, officials of Foreign Settlements, holders (present and prospective) of concessions for the supply of electricity, and the various engineering firms concerned. In view of the multiplicity of voltages, frequencies and systems in use in other countries it seemed both desirable and possible to choose a single low tension system for domestic supply and one or a relatively few systems for generation and transmission.

It may possibly be found that a *single* L. T. system may be too ideal in aim, but it is the object of the Committee to reduce, in any case, the alternatives to the absolute minimum, bearing in mind that the cost of mains should be kept down to the lowest value consistent with efficiency; which means that use must be made of the highest L. T. pressure consistent with safety in operation.

If the Committee succeed in obtaining official recognition (and there is every prospect that it will) of a single L. T. system, the following advantages will be secured.

(1) Buyers of electrical plant will receive tenders on a comparable basis.

(2) The possibility of interconnecting different systems and the consequent use of large bulk supplies, which is almost impossible in many of the larger European cities.

(3) Minimizing the variety of electrical stock, such as lamps, meters, motors, transformers, and general supplies, kept at the trading centres.

(4) The interchangeability of consumers' appliances.

The Committee hopes that the publication of this letter in the various electrical journals of Europe and America will lead to such discussion and support that will assist them in their work.

Thanking you in anticipation,
I am, etc.,
R. A. WILLIAMS,
Secretary,
Electricity Standardization Committee.

Shanghai, Feb. 16

MESSRS. BUTTERFIELD AND SWIRE

The well-known firm of John Swire and Sons, Limited, has been registered with a capital of £500,000, in £100 shares. Objects: To take over the businesses carried on under the styles of John Swire and Sons, in London, and Butterfield and Swire in Hongkong, China, and Japan, and to adopt an agreement with J. Swire, G. W. Swire, C. C. Scott and the executors of the late J. H. Scott. The signatories are:—J. Swire, G. W. Swire, C. C. Scott, J. K. Swire, Mrs. M. Swire, A. G. Swire, and J. M. Scott. Private company. The first directors (to number not less than two nor more than seven) are: J. Swire, G. W. Swire and C. C. Scott (all permanent.) Qualification, 25 shares. Registered office, 8 Billiter square, E. C. The business of the company in the East will continue to be carried on under the style of Butterfield and Swire.

AGREEMENT FOR THE EXPLOITATION OF THE NORTH CHINA OIL FIELDS BETWEEN THE GOVERNMENT OF CHINA AND THE STANDARD OIL COMPANY

The following is the text of the Agreement between the Government of the Republic of China and the Standard Oil Company of New York for the exploitation of oil fields in Shensi and Chihli:—

This Agreement made this 10th day of February 1914 at Peking, China, by and between the Republic of China represented by:—

HSIUNG HSI-LING ....Premier
CHOW TSZ-CHI ....Minister of Finance
CHANG CHIEN .... Minister of Agriculture and Commerce
CHU CHI-CHIEN .... Minister of Communications

and the Standard Oil Company of New York, an American Corporation represented by their Attorney HENRY J. EVERALL.

Witnesseth as follows:—

Whereas Petroleum is known to exist at Yen-ch'ang and other places in Shensi and other Provinces, and whereas the nature, extent, and value of the said petroleum deposits are not fully known, and whereas the Standard Oil Company of New York is one of the most experienced Corporations in the Petroleum Trade, and has facilities at its command superior to any existing organization for exploiting, preparing for consumption and marketing,

Now therefore, we the above contracting parties do hereby solemnly agree:—

1.—The Standard Oil Company of New York will send a thoroughly competent expert, or experts, at once to make a thorough examination of the Yen-Ch'ang Yen-An-Fu and adjoining fields in Shensi Province and Chengtehfu (Jehol) and adjoining fields in Chihli Province. The Government of China will provide all necessary escort, interpreters, and military sufficient to insure the safety of the expedition. Expenses are to be borne by the Standard Oil Company of New York and the Chinese Government jointly.

2.—Upon completion of the examination or at such time in the course of examination when in the opinion of the expert, or experts, sufficient data have been procured to show that the contracting parties can work to advantage the Petroleum fields of Yen-Ch'ang, Yen-An-Fu or Chengtehfu then an American-Chinese Corporation shall be formed comprising both American and Chinese shareholders. The said Corporation is to be chartered in the United States of America and registered in China, and shall begin operating the fields within six months after completion of the survey.

3.—The Capitalization shall be 55 per cent. Standard Oil Company of New York and 37 1/2 per cent. Chinese Government, this 37 1/2 per cent. to be in payment by the American-Chinese Corporation to the Chinese Government for the Franchise. It shall be optional with the Chinese Government to purchase the remaining 7 1/2 per cent. at par within two years from formation of the Corporation. In the event of failure to take up this option, the ownership of this 7 1/2 per cent. remains with the Standard Oil Company of New York. None of the Chinese owned shares mentioned above may be either sold to or owned by other than Chinese during the life of this agreement. Any increase of original capital necessary to work the Petroleum fields mentioned in clauses one, two and four shall be in the same proportions and on the same terms. The absolute and entire control and management of the said American-Chinese Corporation shall be vested in a board of Directors consisting of members of the Standard Oil Company of New York and Chinese in the proportion of the above allotment of shares. The name of the said American-Chinese Corporation, composed as above, shall be mutually arranged between representatives of the Chinese Government and the Standard Oil Company of New York, as well as rules and by-laws governing the same, as soon after the signature of this Agreement as possible. Chinese citizens may purchase shares in the American-Chinese Corporation on the open market.

4.—The Chinese Government hereby promises the Standard Oil Company of New York that the working of Petroleum in the Yen-ch'ang, Yen An-fu and adjoining fields in Shensi Province and Chengtehfu (Jehol) and adjoining fields in Chihli Province shall be exclusively entrusted to the American-Chinese Corporation mentioned above, to develop, refine and market, and that the Chinese Government will give every assistance and protection in doing the same and furthermore will undertake not to give monopolies of Petroleum territories to any other foreigners, but agrees that no concession whatever for petroleum-bearing properties in China be given to other foreigners until the proposed Corporation's workings prove satisfactory to the Chinese Government and the Standard Oil Company of New York, which period shall not exceed one year from date of signing contract.

This Agreement is for sixty years from the date of signature, during which term the Chinese Government promises that no other foreign individual or Corporation will be allowed to produce Petroleum or any of its products in the said districts.

In the event of the Yen-ch'ang, Yen An-fu, Shensi Province or Chengtehfu (Jehol) Chihli Province Fields proving worthless this agreement shall apply to any other district in Shensi or Chihli which the aforesaid experts shall on examination approve.

5.—The Chinese Government promises that all necessary facilities of transportation of Petroleum or its products from point of production to tidewater, such as railway lines or pipe-lines, shall be granted the said American-Chinese Corporation, which Corporation shall construct, maintain and operate such lines in the interest of the said Corporation. Application for same to be made before construction to Board of Communications.

6.—The Chinese Government will arrange with all landowners, or lessors of land, or present workers of Petroleum deposits in the above mentioned fields, that all such petroleum-bearing lands shall be worked by the American-Chinese Corporation aforesaid, and by none other.

All expenses in connection with vacating of any lands for this purpose will be arranged by the Chinese Government, but be paid for by the American-Chinese Corporation.

Royalty on value of Crude Petroleum is not to exceed 1.5% at place of production.

7.—The terms of this Agreement as above are dependent entirely upon the acceptance of same by the Standard Oil Company of New York after the examinations and reports by the experts deputed to investigate.

8.—Should the Chinese Government undertake to arrange for a loan with bankers in the United States the Standard Oil Company of New York agrees to give such loan its tacit support.

9.—This Agreement is drawn up in quadruplicate in the English and Chinese languages. In the event of dispute as to meaning the English version shall be considered binding.

Signed and Sealed at Peking this 10th day of February 1914.

PROGRESS OF THE SCHMIDT SUPERHEATER

The influence of the Schmidt superheater has been so far-reaching that it may be considered one of the most remarkable factor in modern locomotive development. Superheating was not in itself new when Dr. Schmidt commenced dealing therewith in the 'nineties, but whereas most earlier proposals—few of which attained practical trial—were of smokebox type and depended mainly upon waste heat, he insisted from the first that high degree superheat was necessary to realise results of real value. This meant that many practical problems were involved which had not applied to previous experiments, and with the original engines placed in service on the Prussian State Railway in 1898, much pioneer work had to be done, including the design of pistons, piston valves, stuffing boxes, and other parts to meet the conditions created by the high temperature of the steam.

Eventually the initial difficulties were overcome and the value of the appliance conclusively shown. Further engines were equipped in Prussia, and other experimental installations followed in Russia, Belgium, Canada, and the Cape Government railways. The apparatus then employed was of the smokebox type, with a large flue for conveying furnace gases directly to the smokebox. This design was not, however, used for many engines, and it was soon superseded by the original "firetube" apparatus, which was first adopted by Mr. J. B. Flamme in 1902 on the Belgian State Railway. This form included two elements in each large firetube and a two-fold steam path only; but it was applied to numerous engines in various countries and rendered conspicuous success.

But although in this form the apparatus realised a reasonable degree of acceptance and a considerable number of engines of all nationalities and types were equipped therewith, progress was still somewhat slow, except on the Prussian State lines. Then in due course the design was further modified to include the characteristic double-looped tubes, giving a four-fold steam path, and it is this form which has obtained acceptance all over the world. Repeat and additional orders followed, until in 1910 a total of 5,000 engines had been reached. Progress then became much faster, 10,000 being recorded in September, 1911, 15,000 in January, 1912 and 20,000 in January, 1913.

At the present time on the German railways 0,091 engines are provided with such superheaters; in France there are 1,773; and in the English Colonies 2,810. In Great Britain there are nearly 800 engines so fitted, and in Russia well over 900. Austria has nearly 800, Belgium nearly 700, Italy nearly 600, and the United States nearly 8,000. Other countries have less numbers, more or less, in proportion to their sizes. Altogether 435 railway administrations have Schmidt superheaters in use. This as we have already said, is a very remarkable result for ten years' work. It is only four years since the fitting of the 5,000th engine was celebrated in Cassel, and it is confidently expected that before another five years have passed the 100,000th engine will have been supplied with the Schmidt superheater! These figures relate to the Schmidt superheaters only.

Mr. G. J. Churchward, Great Western Railway, was the first to introduce it in the United Kingdom, though he has since used his own moderate-superheat design. Mr. Hughes (Lancashire and Yorkshire) followed, and the Great Northern and London Brighton and South Coast Railways were soon after concerned with trial equipments. On these three lines the Schmidt apparatus has been largely used ever since, and the list of railways now employing it includes virtually every important line, and several smaller ones in the kingdom, from the London and North-Western, where it is systematically employed by Mr. Bowen Cooke for almost all new engines, passenger and goods, to the County Donegal Joint Committee, where it is applied to narrow gauge tank engines.

It is incorporated, almost without variation, in the designs of hundreds of engineers; yet in not one single known instance has the Schmidt apparatus been removed from an engine on account of inefficiency, or because of dissatisfaction or difficulties.

The original British financial support was withdrawn partly in consequence of the liquidation of Messrs. Easton and Anderson, who at first held the patents and were to some extent responsible for development as far as British influence was concerned. Later, control was centralised in Cassel, under the supervision and technical direction of Dr. Schmidt, in the form of the Schmidt'sche Heissdampfgesellschaft G. m. b. H., but the British company has been an important factor in development all along. American interests are controlled by the Locomotive Superheater Company in New York. The present English company is a reorganisation known as the Schmidt Superheating (1910) Co., Ltd.

THE BETHLEHEM STEEL COMPANY

The well known American ordnance works, The Bethlehem Steel Company, have recently been favored by the Republic of Mexico with a large order for war material.

The contract calls for twenty (20) complete batteries of the firm's latest design of three-inch (3") mountain gun, with eighty-thousand (80,000) rounds of high explosive shell and shrapnel for the same, together with a number of six-pounder and three-pounder guns and mounts, and the necessary ammunition.

TRADE BETWEEN THE PHILIPPINES AND INDO-CHINA

The efforts for increased trade relations between Indo-China and the United States have resulted in inquiries for potash, which is an export product of Tonkin, says the *Manila Daily Bulletin*, and continues :—According to latest advices from Hanoi, Speidel and Company and other firms have been requested to send information by several commercial houses on the Pacific coast and in the east.

It is hoped that increased mutual trade relations between the neighboring French colony and the United States will tend to promote a Franco-American understanding in the Far East. For the last two years there was greater intensity in the traditional friendship of the two republics, and the opening of the American market to many French products since the new tariff went into effect has stimulated a move for additional reciprocity.

So far the balance of trade had little equity, specially as regards trade with French colonies, which it is conceded are exclusively administered for the French producer and a high protective tariff makes trade with Indo-China almost impossible.

With the exception of some P.2,000,000, machinery and tools, almost every other article imported into Indo-China was from France.

Manila cigars are imported in very limited quantities, but the good-will shown on the part of Manila merchants has already resulted in an increased consumption of the Manila product in preference to other imported brands, which fact clearly indicates the appreciation of the French people in Indo-China of American sentiment.

In like manner a large share of the machinery imports could be secured by Manila agents of American manufacturers and it seems at this time advisable for local firms to study the market and make proper connections in the aforementioned French colony.

RAILWAY MUSEUM FOR CHINA

For the purpose of diffusing railway knowledge among the Chinese people, the Minister of Communications proposes to establish a Railway Museum in Likuolo Lane behind the building of the Ministry, says a Peking paper, and continues:—The proposed Railway Museum will be placed under the administration of Mr. Hua Nan-kuei, Principal Technical Expert trained in France. The intention of the Ministry in establishing the Museum is to educate the Chinese officials and others as to the necessity of a net-work of railways in the Chinese Republic and also to show foreigners how the Railway enterprise is being pushed forward in this country at the present time. Although this proposed Museum is styled a Railway Museum, departments for the exhibition of telegraphic, postal and navigation articles will be added in future as they are also under the control of the Ministry of Communications. The Government is anxious to have the proposed Railway Museum established as soon as possible so that the Ministry of Agriculture and Commerce may copy the example and establish museums for agricultural and commercial exhibits.

It is stated that the first electrical plant to relieve the Arctic darkness will be erected at the Episcopal Mission at Point Hope. It will be designed, built and equipped by Dr. W. E. Temple, head of the electrical engineering department of the University of Pennsylvania. The site on which the plant will be erected will be 100 miles north of the Arctic circle. A huge windmill will be the prime mover, as the velocity of the wind at Point Hope is said to be rarely less than twenty miles an hour, but an auxiliary petrol motor is to be installed. The mission at Point Hope possesses about 400 inhabitants.

At the recent New York Automobile Show, 87 per cent. of the American cars had an electric engine starting equipment as a standard fitting and as an integral part of the chassis; 1 per cent. of the cars had acetylene starting outfits, and 4 per cent. air starters. As an optional extra electric starters could be fitted to 2 per cent., and mechanical starters to 1 per cent. The most striking point in connection with the above is that in only 5 per cent. of all cars shown was no provision made for some form of engine starter. At Olympia and Paris the percentage was probably the other way about, *i.e.*, possibly 5 per cent. of the cars had some such provision.

At present the greater part of the commerce to the region around Jerusalem passes through Jaffa. This port is a very inferior one and only small coasting vessels can penetrate within the belt of dangerous rocks that encircles it. Large steamers and other ships have to remain in the open sea a mile or two from shore and have their passengers and merchandise landed in large surf boats. Some time ago it was planned to establish a new port at Jaffa. It is only recently, however, that offers were made to obtain the concession. A French company expects to commence operations next summer. The work on the harbour will cost about £1,000,000 There is also a railway concession. A new line will be built from Rayak, on the Beirut—Damascus line to Lydda, on the Jaffa—Jerusalem line. This line will develop the rich plains of Esdraelon and Sharon, and it will be possible to journey from Jerusalem to Constantinople by railway *viâ* the Aleppo branch of the Baghdad line. Jerusalem's position will thus be greatly improved.

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THE FAR EASTERN REVIEW

COMMERCE :-: ENGINEERING :-: FINANCE

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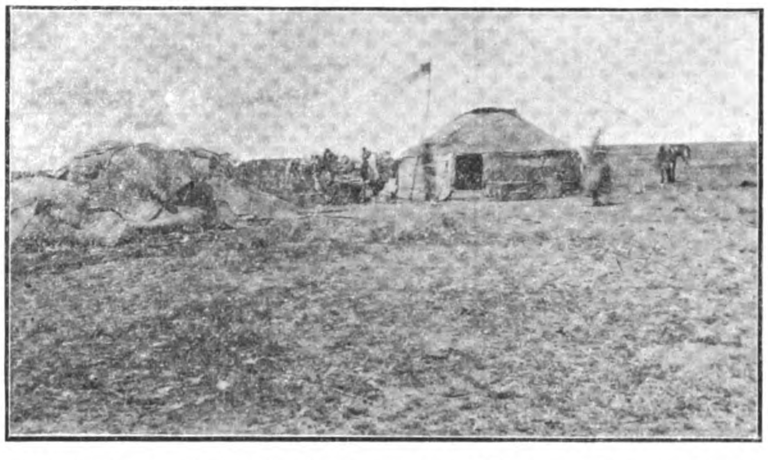
SOME RUSSIAN ENTERPRISES IN NORTH EASTERN MONGOLIA AND BARGA

[BY LIEUTENANT G. C. BINSTEED, THE ESSEX REGIMENT.]

So many wild statements have appeared in the Far Eastern press as to the commercial part now being played by Russians in Outer Mongolia that it may not be without interest to state in bald facts exactly what Russian enterprise was met with by the writer in the course of a journey of about 900 miles in length through Barga and North Eastern Mongolia. It is not the intention here to discuss the motives or soundness underlying the Russian Government's economic policy towards Mongolia, the failure of the Russian commercial circles to respond to the openings created for them, the mutual recriminations of the Russian official and commercial worlds, the avowed and the secret desires and policies of the various Mongol cliques, or the question as to whose interest it was that a state of war should be maintained on the frontiers of China. More time must elapse and more information become available before it would be anything but presumptuous to venture to extract the truth. Beyond individual facts for which I can personally vouch, I shall only make such few generalisations as I believe to be true and as have universally admitted by all the parties concerned, Russian officials and traders and Mongols. Lastly, everything here mentioned, unless otherwise specially stated, refers only to the area traversed by the writer's route, namely from Hailar via Gandjur and round the south of Dalai Nor to the mouth of the Kerulen, thence following the Kerulen as far as Tsetsen Khan's Urgo (seat), thence straight to Urga, thence to the Mongolyor Goldfields on the Upper Iro and so to Kiakhta.



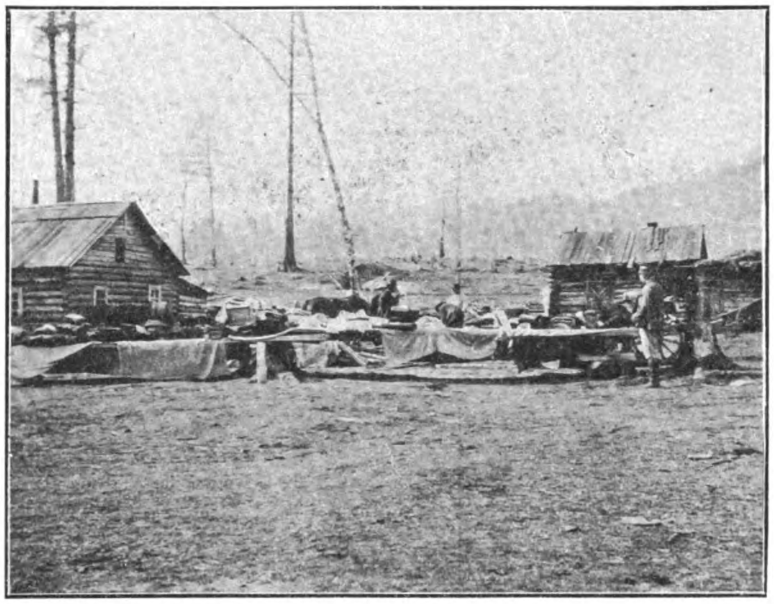
The trading yurt of a Russian on the lower Kerulen in Barga, 5 day's bullock cart journey from Manchuria Station. Part of the raw products received in exchange are under the matting on the left awaiting despatch to the railway.

I will deal with Trade first. Leaving out of consideration for the present the town of Urga, where I did not stay long enough to make adequate enquiries, along the rest of the route not only was the absolute volume of Russian Trade remarkably small, but its increase on last year was also insignificant. Along the whole route of 700 miles between Hailar and Urga only 4 Russian trading establishments were met. Of these, 2 did not even boast of a hut, but had their whole stock disposed in one or two yurts. Of these 4 firms, 3 were concentrated at one point, San Peitzu Urgo, where last year there was only 1 Russian firm. Of the two new firms here 1 is a new arrival, whilst the other is only an offshoot from the firm of last year, founded by two of the latter's shop assistants. This lack of increase in Russian trade would not be very surprising were it not for the magnificent opportunity created for the Russian merchant by the Mongol policy of heavily handicapping his Chinese rival with customs dues and, far more potent, by the brigandage and warfare which completely prevented the passage of goods from North China to supply the Chinese firms in Outer Mongolia. The result of the latter is that, on the same route between Hailar and Urga, out of at least 40 Chinese firms who were trading in 1912, in August and September 1913 only two had any goods to sell. Some firms had quitted and returned to China via the northern railway route, whilst in others the assistants were remaining on, sometimes to collect outstanding debts, sometimes to wait and see what would happen later, sometimes because, having no money to buy railway tickets, there was no other alternative but to remain till the cheap route by bullock cart across the Gobi again became safe for the inoffensive trader.

Thus a route which in 1912 was served by over 40 firms, had now to depend on only 6, of which all but 1 were situated at the single point of San Peitzu Urgo. Had the Chinese been able to obtain goods by the usual cheap cart routes from Kalgan and Dolonor, the inertness of the Russians would not be surprising, because neither the 5% ad valorem duty on imported goods nor the tax of 1 tael on every horse or head of cattle bought or sold, nor any other disabilities which the Urga princes could in reason be persuaded to impose, would prevent the Chinese being able to compete successfully with his rival. But the Chinese being deprived of his source of supply, the Russian trader was given a free field and it is therefore not surprising that Russian officialdom is disappointed at the way a situation so successfully prepared has been almost ignored, more especially because there has arisen in consequence a considerable revulsion of feeling amongst the Mongols against the new state of affairs. For the result to the Mongol was either that he could not obtain at all the goods to which he has become accustomed, or that, where he happened to be within reach of a Russian firm, he had to pay a much higher price than that demanded formerly by the Chinese.

The pioneer Russian farmer in Mongolia with his family and farm hands in the farmyard.

That this situation cannot last is obvious and it will probably already be at an end when these words are printed. Russian commercial opinion generally is that the status of Russian industrial production, being still unable, except in years of a bad harvest, to cope with the internal demand, is not in a position to export to Mongolia in such a way as to supplant the wares with which the Chinese have hitherto traded. The last few years have seen excellent harvests in Russia; consequently the purchasing power of the Russian masses, whose phenomenal rate of increase is beginning to attract attention outside Russia, has been very great. Not only merchants, but officials also, now realise that the Mongolian market cannot be conquered with Russian goods. The proposal is, however, now afoot to the effect that government and merchants should cooperate to enable Russians to trade in Mongolia not with Russian goods but with wares with which the Chinese have been so successful in the past and to the use of which the conservative Mongol has become addicted. These goods are of British, German, American, Japanese and Chinese origin and are acquired by the Chinese traders in the great centres of North China. Two schemes are mentioned whereby the Russian merchant may be enabled to trade with these goods. The first is that the Russian Government should grant special facilities for the transit of these goods from Vladivostok to Kiakhta with remission of dues, so that they may be sold at a price able to compete with the same goods imported by Chinese via Kalgan when handicapped with the Mongol 5% ad valorem duty and the dues at the Chinese treaty ports and likin or transit dues. The other scheme is for the import of these good into Mongolia from Manchuria Station. This avoids the necessity of entering the Russian Empire, a circumstance which entails all the formalities which make the Russian customs service so irksome to its own nationals. An excellent natural highway leads from Manchuria Station via the Kerulen valley to Urga, along which it has been proposed to institute motor traffic. As far as the road is concerned this would only entail the cost of one bridge or one good ferry.



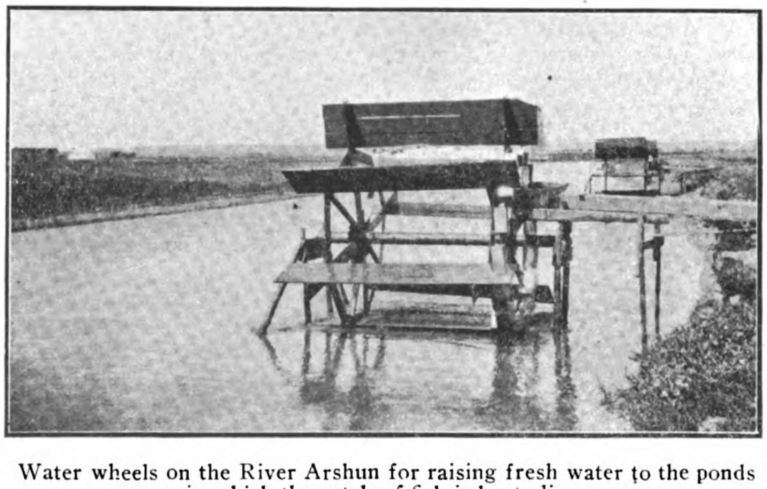
The outdoor stalls on which Tartar hawkers display the goods they have brought to the Mongolyor Goldfields.

In the meantime the Mongols, to prevent themselves being starved of their requirements in clothing and manufactured articles, will have to arrange for the safe passage of goods from China to the Chinese firms remaining in Khalkha. A large caravan was thus safely brought through to Urga in September 1913, the Bogdo Gegen giving special orders for its protection. The goods it brought were sold at once and must have done much to relieve the scarcity in Urga which was a matter of universal complaint at the time of my stay there in September. Russians no less than Mongols murmured bitterly against the high prices exacted by their fellow countrymen and the indifference shown in the matter of maintaining a stock of what was required by the town. At the time of my passage no kerosene oil or spirit was anywhere obtainable. Oats cost from Roubles 1.80 upwards per 36 lbs !

It was over a year and a half since a former visit to Urga. I expected to see a considerable increase in the number of Russian shops and houses, but in reality the change observed was very small. I was informed that many agents from Russia had arrived during the summer for the purpose of reporting on the desirability of opening business here, but that the majority had gone away with an unfavourable impression. The personnel in the firms already existing is not of a class likely to develop business on a large scale. In accordance with the provisions of the Urga Protocol, the Russian community in Urga has been constituted into a trade settlement with a council able to impose rates. Judging by the opinions of private residents, the innovation is neither popular nor successful.

On the route followed from Urga to Kiakhta the only Russian shops met with where those maintained by the Mongolyor company at its goldfields for the convenience of its staff, employees and other gold seekers. Besides these shops itinerant Tartar hawkers come from Troitzkosavsk to sell at the goldfields.

In the special branch of live stock trading, I am unable to say whether Russian participation has increased or not. This trade is also combined with that of trading in manufactured goods, for the reason that in Mongolia barter still predominates and not payment in money. The Mongol in exchange for the manufactured goods he receives, gives live stock, its manifold raw products and the one article of foreign use which he is capable of making, namely felt. This barter system is what causes trade with the Mongol to be so very lucrative, for the nomad parts generally with his live stock and having never been allowed to learn what really good manufactured goods are like, accepts inferior goods at rates usually charged for good wares.



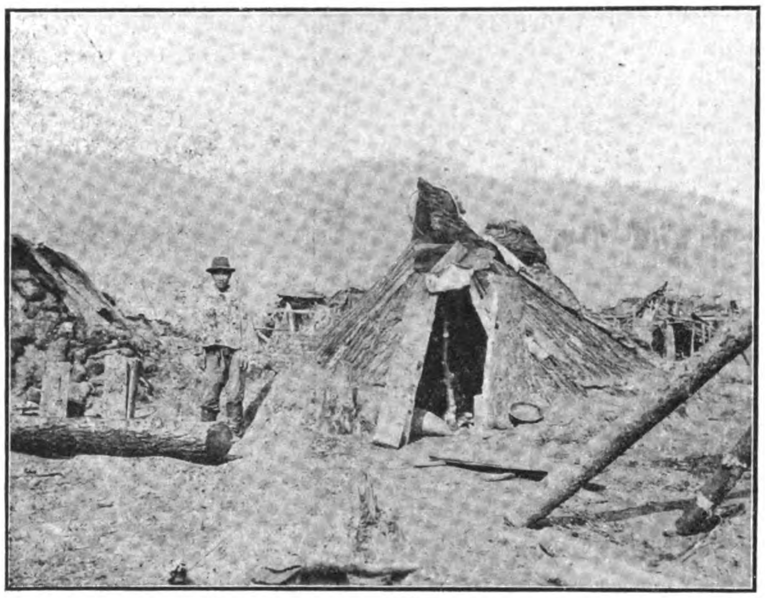
Water wheels on the River Arshun for raising fresh water to the ponds in which the catch of fish is kept alive.

Three Chinese shop assistants belonging to a Peking firm at Tsetsen Khan Urgo.

Whether on the increase or not, considerable purchases in horses, cattle and sheep are made by Russians in Barga, the lower Kerulen valley, and Uchumuchin. The animals go to Manchuria Station and Hailar, a large part finally finding their way into Priamuria where they fetch a big profit in a country which depends for its live stock almost entirely on Mongolia.

Lastly mention must be made of the great annual Fair at Gandjur in Barga to which Russians resort in large numbers and which lasts during the first ten days of the 8th Moon (this year, 1913, August 31st—September 9th).

Much good should eventually be done by the veterinary detachments which are now despatched from the veterinary institutions at Chita, Harbin and other places into Mongolia, where they inoculate all cattle on purchase by Russian traders before it enters Russian territory. They also inoculate for Mongols if the latter can be persuaded to call in their aid, but at present ignorance and prejudice often prevent the Mongol from seeing the great advantages to his stock to be derived from a comparatively small outlay.



Huts made of birch bark and inhabited by the Chinese coolies at the Mongolyor goldfields

Agriculture

Along my route, and to the best of my knowledge in all Mongolia, the area under cultivation by Russians is limited to a very few acres, chiefly close to the border near Kiakhta. It is said that one of the clauses in the Agreement just (Nov. 9th) arrived at between the Russian and Chinese Governments stipulates that Russia, no less than China, agrees not to colonise Mongolia. It is evident to all those who know the difficulties which the Russian government has to overcome in its plans for colonising its own territory in Asia, that there could be no desire to encourage a leakage of colonists into Mongolia. If additional proof of this were required, it is furnished by the fact that the abolition of the 50 verst free trade zone has been made to apply not only to the frontier with Manchuria but also to that with Outer Mongolia. Formerly the few Russians living in Mongolia and also those on the Russian side of the border obtained great benefit by selling or using in Siberia the timber, fish, and hay which they were able to acquire in Mongolia free of all cost beyond their own time and labour. In future R.2.50 will be exacted for every pood (36 lbs) of fish that is sent across the border. Timber will be taxed and also flour.

Chinese agriculture has, on the other hand, been considerably developed in the valley bottoms of the Tola, Orkhon, Hara, Iro and their tributaries. Owing to the disabilities under which Chinese are now placed and the increased rent exacted by the new central Urga Government, a large number of Chinese farmers have given up their farms and returned to China. The great majority however still remain. But the vacated farms would seem to offer splendid opportunities to Russian colonists, were they encouraged.

Around and between Urga and Kiakhta a large haymaking industry has sprung up of late years. It should be noted that in parts of Mongolia unaffected by foreign influences in this respect, no hay whatever is made. In this industry Russians take a certain part both in making and in trading with hay. Labour being expensive hay costs about 10 kopecks (2½d) per pood (36 lbs) to make. It is sold in Urga for 50 kopecks per pood and in Kiakhta for 40 kopecks.

Fisheries.

No true Mongol ever catches or eats fish and until lately the Mongols looked with hostility upon others who fished in their rivers. But contact with the outer world which sanctions such anomalies as a reincarnated Boddhisattiva ordering the training of an army on modern lines, has also caused the Mongol authorities to see the advantage of deriving revenue from the lease of fishery concessions. On the Tola, Hara, and Iro Russians fish free, but there are no reserved concessions nor fishery establishments. In Barga, however, I came upon a very extensive fishing industry on the River Arshun. A few years ago a certain Russian named Borisoff who had considerable relations with the local Mongols, at last succeeded in being allowed to fish a small section on Dalai Nor. After the secession of Barga from the Chinese Republic, two or three other Russians last year also succeeded in obtaining concessions on the Arshun for which they only paid Roubles 100 per verst (2/3 mile) of river reach. Owing to the past inviolability of the fish, the river is extraordinarily rich. It is recounted that horses in fording would sometimes refuse to proceed owing to the almost solid stream of fish that knocked against their legs. Attracted by the success of the first comers, this year the concessionaries have risen in number to 27, working no more than 60 versts of the river's total course of some 240 versts (160 miles) between Buir Nor and Dalai Nor. The Bargut authorities have raised the price this year to Roubles 600 per verst per year for a minimum lease of 5 years.

The huts inhabited by Russians at the Arshun Fisheries.

The road made by the Mongolyor Company to connect its goldfields with Kiakhta.

The fish are caught in nets and transferred at once to large ponds, (called in Russian sadók, plural sadkí) where they are kept alive till the winter. These ponds are supplied with fresh water by means of water wheels on the river which raise the water into troughs along which it runs to the ponds. Nevertheless the fish are very crowded and some die of want of space. When permanent hard frost has set in, the fish are taken out of the pond, thrown on to the ice where they freeze immediately and are then packed for despatch via Manchuria Station to all parts of Siberia and Russia. The demand always exceeds the catch, in spite of the richness of the latter. The chief species are those which are known in Russian terminology as sazán (a delicacy, Alexandroff's Dictionary translates as carp?), som (silurus?) Shchúka (pike), karass (crucian carp?).

The Russian concessionaries come from all parts of Siberia and Russia and are mostly men who have had fishery experience there. A large proportion are Jews. The process of obtaining a concession here is as follows:—the Russian chooses his site on the spot, obtains from the local Tzangin (a Mongol local official) a certificate, repairs to the yamen of the Amban or Viceroy of the Urga Hutukhta in Hailar and there obtains his lease. Russians unanimously testified that every forward step which depended on the Bargut authorities could only be made after conceding large bribes, without which reasons were always found for delays which cost the concessionaire even more money than the bribe. The concessionaires also quarrel much amongst themselves and mutual charges are made as to the illegal use of wire net barriers in the river bed to prevent the passage of the fish up or down stream. In autumn the fish move from Dalai Nor up to Buir Nor, returning downwards next spring. Some concessions occupy as much as 15 versts of reach. They all have at least 5 Russians in the personnel, but the mass of the labour employed is Korean, Chinese, and Japanese, while one master has brought with him from Tomsk Government a number of Ostiaks. All employees may use as much fish as they like for their own consumption. All other food and everything else except quarters they provide themselves out of their monthly wages which are as follows:—

To a Chinese R. 25 to 20
„ Korean R. 30
„ Ostiak R. 30 to 25
„ Russian R. 40 to 25

The employees are bound to serve for a whole season if the employer desires to retain them. The master stocks necessary provisions which he sells to his employees. Prices are such that a Chinese has to spend every month about R. 4.50 upon his food exclusive of the free fish. The Korean is regarded as the most desirable employee, as he is easy to manage, does not drink and works well. The Chinese has the reputation of being insolent and truculent, while the Russian's power of work is somewhat detracted from by the uncertainty as to his soberness.

The figures below illustrate the catch at those concessions which happened to lie upon my road.

In 4 versts during summer of 1913 up to August 18th 110,000 fish caught. Last year 5,000 poods of fish (over 80 tons) were put into one pond.

The personnel live in log cabins or mud huts often half underground. The character of these buildings hardly seems to indicate an intention on the part of the concessionaires to build up a permanent industry, and the mutual competition to catch as many fish as possible each season would also seem to confirm the opinion that the employers only wish to make a fortune while present abundance of fish lasts, regardless of the future.

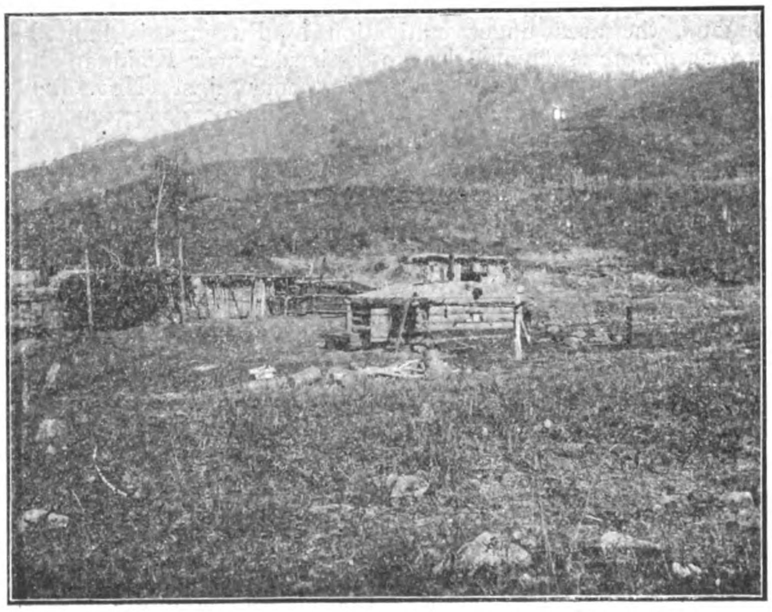
Mining

Nowhere was any mining met with except at the goldfields of the Mongolyor Company in the basin of the river Iro. As is well known this company was formed and registered in Russia by von Grote and acquired from the Chinese Government the exclusive right to prospect for and exploit all gold in the two Aimaks of Tushetu Khan and Tsetsen Khan. Lately I. V. Pokrovski has been appointed local Director in chief of the Company in place of von Grote, who left the Company owing to his dislike of the new Mongol Government.

The Company now works the following fields in the Iro basin:—

Iro	Narin-Harganati
Tologoika	Yalbik
Mogoi	Ulentoi
Harganati	Nilkho

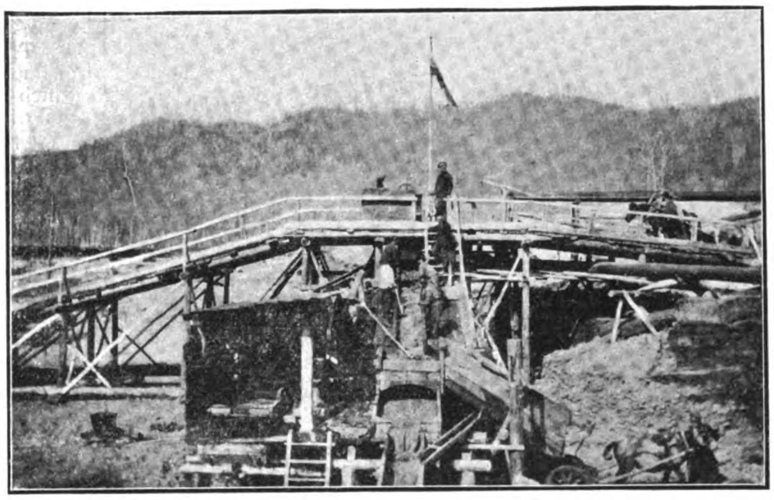
whilst outside the Iro basin work is already carried on in the valleys of the Kudara (a tributary of the Chikoi in Mongolia). Tereltzi (tributary of the upper Kerulen), and Hera Gol at Tzo Modo. Prospecting, which is chiefly carried out during the winter, is being further extended in the Kerulen and Onon basins and S. W. of Urga. Mr. Pokrovski himself hopes next year to reconnoitre the Onon and Uldza areas. The administrative headquarters and head offices of the Company have just been moved from Urga to the Iro Goldfield. These are connected by telephone with the other fields in the Iro basin, but the projected plan for a telephone line to Urga has not yet been realised. A map of the area from Kiakhta to Urga has already been partly made and is being completed. This survey will later be extended to the new areas in which it is



Chinese log cabins at the Mongolyor goldfields.

hoped that gold will be found. A postal service connects the Iro headquarters with Urga. All the gold obtained by the company is sent via Kiakhta and Russia to Belgian and French firms. The Russian Government is a somewhat unsatisfactory purchaser for the reason, that they refuse to pay on delivery for the total amount received; they only consent to pay for the nearest round number quantity in weight below what is actually delivered. As gold is very expensive when compared to its weight, it often happens that large sums of money are left owing to the vendor until the next consignment of gold arrives. The Belgian and French firms on the other hand pay at once the exact price and even at a somewhat higher rate than the Russian Government, for the total amount delivered at each consignment.

The Mongolyor Company uses 3 methods for obtaining its gold. These are: (1) Work by the Company itself by means of labourers hired by the day. (2) The lease of whole areas to capitalised organisations who find all the necessary capital for exploitation, pay no rent, but are bound to sell all gold obtained to the Mongolyor Company at rates from Roubles 24 to 27 per Chinese liang of weight. (3) Lease of small areas to minor combinations of labourers who are provided by the Company with the necessary equipment and are bound to sell all gold to the Company for about R. 24 per liang. To its own day-labourers the Company pays a daily wage of R. 1.00 to Russians and R. 0.80 to Chinese. The Company is now instituting more modern methods with machinery and horse traction for the earth carts. Inspectors are appointed to prevent any stealing of gold by day-labourers or by the minor lessees of areas. Sealed dredgers are also used for the purpose. All workers on the mines pay to the Mongol Government a tax of R. 1.00 per head per month for the right to work on the fields, in exchange for which they receive a form of passport.



The gold washing machinery used by the Mongolyor Company.

On the whole Chinese still predominate somewhat in the goldfields though large numbers have departed recently partly owing to the disabilities imposed upon them by the Mongol Government, partly owing to new regulations by the Company whereby, instead of receiving a modicum of food during the winter, they are now left to find a livelihood for themselves, and partly owing to the great recrudescence of brigandage in the neighbourhood. The latter circumstance accounts for the departure of very large numbers not only of Chinese but also of Russian workers from the goldfields. This summer brigandage became so bad that about 100 Russian soldiers from Kiakhta were sent into the area, and were distributed from the Khangai range N. W. of Kornakovka eastwards to the Iro Goldfield. The increase of brigandage is itself chiefly due to the fact that now numbers of Chinese are left without means of livelihood during the winter.

The following figures give the yearly find of gold in the Mongolyor fields to the nearest pood:—

1901-1908	average	11 poods
1908-09	,,	71 ,,
1910	,,	120 ,,
1911	,,	120 ,,

The yearly profits of the Company were as follows:—

1907-08	R. 14,603
1908-09	R. 171,807
1910	R. 373,877
1911	R. 338,431

Hunting

At the close of the harvest in early autumn numerous parties of peasants from the frontier villages in Transbaikalia leave their homes for two or three months' hunting in the forest and mountain country of the Kentei. With the help of specially trained dogs they succeed in shooting large numbers of squirrel, bear, tarbagan (marmot) and sable. These hides and furs they sell on return at the local fairs in Transbaikalia, whence the wares find their way chiefly to the great yearly mart at Irbit.

Beyond what has been mentioned above, no other Russian enterprise was encountered. With the exception of the Mongolyor Company, none of the operations could be classed as very important.

[The photographs accompanying this article were taken by Lieut. Binsteed.]

ELECTRICAL SUPPLY FOR MANILA

The *Manila Times* states that Mr. C. M. Swift, President of the Manila Electric Railroad and Light Company, has applied for a franchise for the development of the water power of the Caliraya river, which will involve an expenditure of P. 4,000,000.

The request for this franchise, forwarded to the Governor General some time ago, was by the chief executive referred to the newly created board of public utilities commissioners. Certain minor changes in the terms under which it might be granted were made by the board, and these were agreed to by Mr. Swift. The form in which the matter came before the Commission therefore, embodied these changes, and it carried the recommendation of the board that the franchise be granted by the Legislature.

The grant in perpetuity of the water power of the Caliraya river is already in the possession of the Manila Suburban Railways Company, but it has been assigned to Mr. Swift, and the present franchise does no more, in effect, than to confer on him the right to bring the power across the country into Manila. It gives him the powers necessary for the securing of right of way for transmission, and provides that he must organize a corporation, subject to regulation and control as a public utility.

The Caliraya river is one of the tributaries of the Pagsanjan river. The diversion dam would probably be built at a point about two miles in a direct line from Pagsanjan falls, and since the falls are on another branch of the river, they would not be interfered with by the project. From the diversion dam the water will be carried through a series of tunnels, reservoirs and canals to the brink of a steep slope, and there it will take a drop of nearly 800 feet. This big drop is expected to develop ample power for the electrical needs of the city of Manila for years to come.

The transmission lines will come from Pagsanjan across an arm of Laguna de Bay, and then along the north side of the lake as nearly as possible in a straight line through Pasig and into Manila. Thus they would not touch any considerable settlement except Pasig, which already has its electrical system, and thus will not need the power which the proposed lines might furnish. Broadly speaking, it is for the city of Manila alone that the Caliraya river source of power will be developed.

The franchise asked for is for 99 years. It has an important limitation, however, providing that if the city of Manila should take over the Manila electric railroad and light company in 1927, then it may also take over this power development.

BREAKWATER AT CHEFOO

A Chefoo correspondent states that Mr. van Lidthe, the Consulting Engineer to the Harbour Commission, has produced a preliminary plan of the breakwater and is now busily engaged in elaborating and improving it. There is no doubt that the Commission has been very fortunate in its engineer for no one could have approached a task, which is admittedly difficult, with more keenness and resource. The plan and financial scheme will now go to the high authorities at Peking for acceptance or amendment, and then Chefoo will certainly be a step nearer the much-talked-of breakwater.

REVIEW OF PHILIPPINE TRADE FOR 1913

[BY JOHN R. ARNOLD, OF THE EXECUTIVE BUREAU AT MANILA]

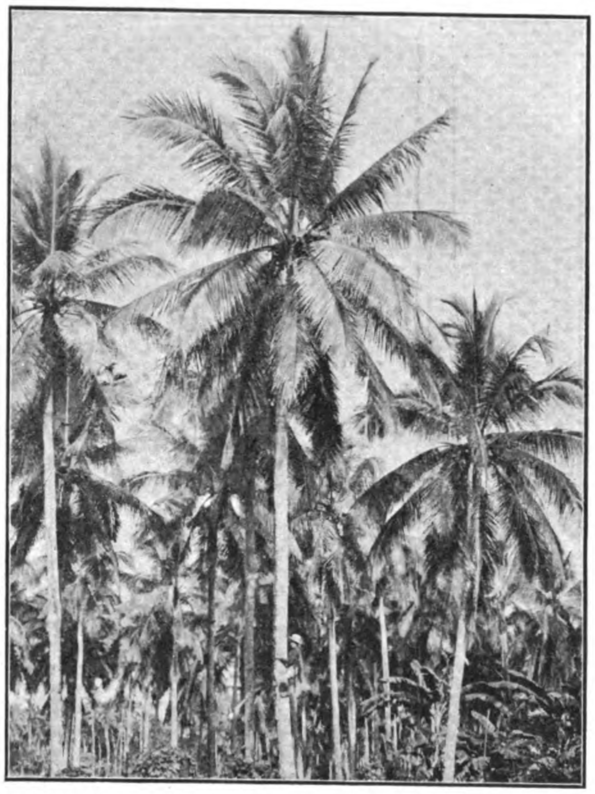
Detailed figures are now available for a review of the trade of the Philippine Islands for the fiscal year 1913 (July 1, 1912, to June 30, 1913). The total volume of trade, while showing a satisfactory increase over the preceding year, was slightly less than the figures for the first 6, or even the first 10, months prognosticated. On the basis of the former an estimate of a final total of $120,000,000 was made; on the basis of the latter an estimate of $112,000,000; the actual figure was $110,010,859.

This falling off as compared with the advance estimates clearly points to the operation of conditions tending to restrict commercial enterprises during the latter months of the year and affecting both imports and exports. The most important change in imports was the marked contraction in receipts of rice, which amounted to but $7,940,857, as against $10,569,949 for the preceding year—a drop of nearly 25 per cent. This decrease in importations of the principal cereal food of the country means, of course, an immense saving to the population at large and is directly traceable to a particularly abundant Philippine crop at the last harvest—occurring about the middle of the year—and marking the end of the disastrous shortage which followed on the severe drought of 1911-12. This part of the decrease in estimated imports in itself is therefore not in any sense an unwelcome phenomenon.

In exports the falling off from the estimates was due to a drop in price of abaca (Manila hemp) toward the end of the year, to the poor quality and resulting low price of the sugar crop, and to a diminution of the copra output as the accumulated result of typhoons and drought in 1911 and 1912. Both imports and exports have also been affected by the widespread local business stagnation of the last few months, arising from the fear of political changes which would react unfavorably on the economic condition of the islands.

A FAVORABLE VOLUME OF TRADE

The final figures, however, though smaller than anticipated, are not unsatisfactory. The total volume of trade, as stated, was $110,010,859, representing an increase of a trifle less than 5 per cent. over the figure for 1912, which was $104,869,816. The value of imports ($56,327,533 in 1913 as against $54,549,980 in 1912) increased about 3¼ per cent. and the exports rose ($53,683,326 as against $50,319,836) a little more than 6⅔ per cent. The gross increase in imports, however, was materially affected by the reduced imports of rice during the latter part of the year; eliminating that commodity other imports during the fiscal year just closed amounted to $48,386,676, as against $43,980,031 in 1912, a gain of 10 per cent. The receipts of rice for the year 1913 as a whole formed about the same proportion (averaging 15 per cent.) of the total imports as they formed every year from 1905 until the crop failures brought about by the severe drought of 1911-12. This may, therefore, be considered, about the normal percentage under present conditions; and it seems too early to prophesy, as has to some extent been done locally, that the decrease during 1913 indicates a permanent advance toward the solution of the problem of the islands providing their own food supply.



Coconut Grove, Magdalena, Laguna. Almost fruitless on account of drought and close planting. Note Filipino *walking up* the trunk without use of cord at ankles or waist.

FURTHER GAINS BY AMERICAN COTTON GOODS

The gain in the year's imports is the result of increases in most classes of merchandise, with the single exception of rice. There was a 25 per cent. advance in importations of cotton goods—from $9,246,595 in 1912 to $11,583,638 in 1913, the highest figure yet recorded. Cotton goods again held first place among Philippine imports, which position they had usually taken, but from which they were temporarily displaced by rice; and the increase which they show accounts for more than half of the gain in all imports excluding rice.

Of the islands' total purchases of cotton goods during 1913 there came from the United States $6,827,082 worth, or 59 per cent.; this was as against 44, 39, and 24 per cent. for 1912, 1911, and 1910, respectively—these being the three years that have elapsed since the establishment of free trade between the United States and the Philippines—and as against a share of about 7½ per cent. for 1909 and 1908. Such proof of the beneficial effect to American trade with the islands following the removal of the former restrictions seems to require no comment. Imports of cotton goods from the United Kingdom decreased from $3,499,350 in 1912 to $2,325,460 in 1913, while those from other foreign countries during the same period declined, remained stationary, or at the most advanced very slightly.

INCREASED IMPORTS IN MANY LINES

There were marked increases also in imports of iron and steel products, flour, illuminating oil, coal, leather goods, chemicals, drugs, and dyes, and vegetable fibers. The only important items showing decreases were meat and dairy products and live cattle. The losses in the latter were due to the continued effect of the application of quarantines in connection with the campaign against cattle diseases. This affects particularly shipments from Indo-China and from China and Hongkong, and to a less degree those from Australasia.

Imports of iron and steel products rose in value from $6,031,603 in 1912 to $6,608,914 in 1913, or 9.6 per cent. More than four-fifths of this gain was accounted for by imports of machinery (which formed 40 per cent. of the total), and more than a third of this increase in machinery was in sugar machinery alone, over one-half of which was credited to the United States and Hawaii. There were also marked advances in imports of steam locomotives, traction engines, boilers, and mining machinery, which (except that the last item came chiefly from Australasia and Hongkong) were shared by the United States and the United Kingdom. There was a heavy decline in imports of sewing machines, and small increases in those of bar, rod, and structural iron and steel, tools, enameled ware, pipes and fittings, screws, nuts, bolts, and rivets.

PURCHASES OF FOODSTUFFS, CHEMICALS, AND CEMENT

There was a falling off of 6.6 per cent. in imports of meat and dairy products, for which no reason other than ordinary fluctuation of demand can be assigned. It was felt principally in meats. The receipts of breadstuffs rose from $2,563,512 in 1912 to $2,955,552 in 1913, or 15 per cent. This advance centered in wheat flour, imports of which were $471,000 larger than in 1912; the United States absorbed this increase and gained on the principal competitor, Australasia. The increases in leather goods (principally boots and shoes) and in chemicals, drugs, and dyes, were largely to the advantage of the United States. Relatively important gains were also shown by fish and fish products and cement; to the United States is credited more than half of the increase in the former, but in the latter the gain went to Germany, principally at the expense of Hongkong. It is expected that there will be local competition in the cement market within another twelvemonth.

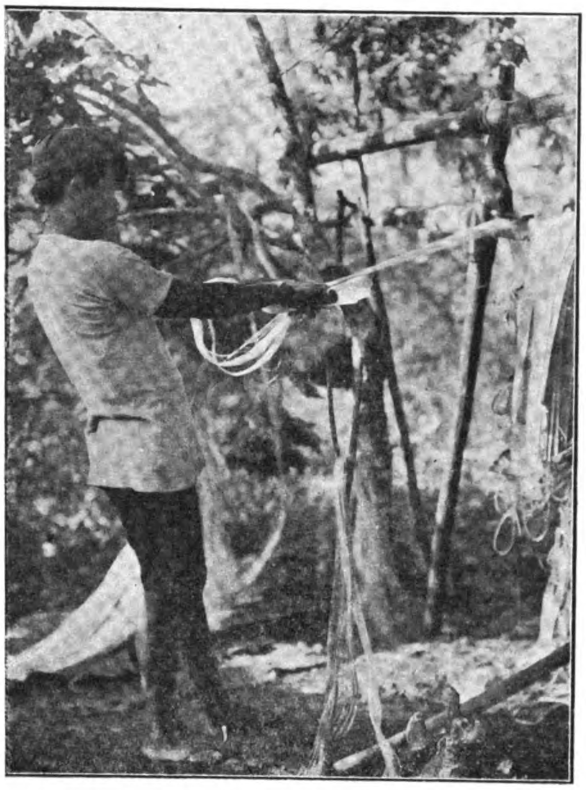
EXPORTS AND PRICES OF HEMP

The great bulk of the exports from the Philippines (92 per cent. during the year just closed) continues to consist of the four staple products, abaca (Manila hemp), copra, raw sugar, and tobacco and tobacco products. Shipments of abaca aggregated 153,000 metric tons (metric ton 2,204.6 pounds) in 1912 and only 144,000 tons in 1913; but during the same period there was an increase in value from $16,283,510 to $23,044,744. In 1912 the value of the abaca exported was slightly less than that of the copra; in 1913 it was nearly twice as great. In 1912 it amounted to 32 per cent. of the total exports; in 1913 to 43 per cent. Its average price in the former year was $106 per ton; in the latter $160.

A committee which had been engaged in investigating the abaca industry stated in a report rendered in April 1913 that the great increase in price which first became noticeable about the beginning of the year under consideration, was apparently of a speculative nature and not justified on a normal market. It pointed out that both the very large increase in consumption and the decrease in supply from bad climatic conditions, which had been predicted, had in all probability been overestimated. This opinion proved to be justified, at least to the extent that the boom was not maintained at the same level throughout the year. The total exports of abaca fell from $12,554,302 for the first six months to $10,490,442 for the succeeding six months; and the average price per ton, after running from $175 in January up to $226 in February, and fluctuating between $176 to $197 during the three months following, declined in June to $152. Throughout July prices were reported very unsatisfactory (averaging less than $120), and exports fell off materially. Recently there has again been an improvement, but it is too early to predict the effect of any of these changes on the figures for the current fiscal year.

It should, however, be noted that, so far as any of the prices for periods before the end of June, 1913, are concerned, the lowest was little below the general average for the year and was higher than the highest

reached during the last six months of 1912. However just may be the committee's criticism of the considerable rise in prices early in the year, it seems safe to say that the recovery from the extremely depressed condition of the trade (which reached its worst phase in 1911 and 1912) is more than merely temporary.



Stripping Abaca. ("Manila Hemp") "Davao Method," Santa Cruz, Davao. Note the pile of "laxa," or leaf-bases (at right) for stripping, and one being pulled through under the sharp bamboo knife.

PLANS FOR IMPROVING THE POSITION OF MANILA HEMP

At the same time the general conditions of the abaca industry, as regards grading, improvement in methods of stripping, and reorganization of the provincial buying trade in such manner as to insure a fair price to cultivators, remain unsatisfactory. In December, 1911, the Philippine Commission appointed a committee of two of its members to report on the situation. This committee did not render its report until April, 1913; it then recommended as the most necessary measures a campaign of education in cultivation, cleaning, and grading the fiber, and in determining the proper price: the formation of co-operative unions of producers with possible future assistance from the Agricultural Bank; and the establishment of a system of official grading and stamping This last recommendation is opposed by the large hemp dealers, and the whole question may be made the subject of a future report, though lack of space prevents its further discussion here.

To carry out the program the committee recommended legislation standardizing the grades of abaca, penalizing the export of inferior or unclassified qualities, and providing for the appointment of Government classifiers and for the reimbursement of their salaries and of other expenses by charges for classification and stamping.

The abaca shipped to the United States during 1913 was about half the total for that year, slightly more than in 1911 and 1912, and slightly less than in 1910; the fluctuations in this respect have not been very great. The same has been chiefly true of the proportions of the exported product taken by the principal foreign countries. The demand from Germany and Hongkong, however, dropped sharply during the past year, while that from Spain and Japan increased.

BUSINESS IN COPRA—DOMESTIC OIL MILLS

Exports of copra, which reached their highest point in 1912, fell off markedly during the fiscal year just closed, the actual figures being $16,514,749 and $11,647,898, a loss of nearly 30 per cent. The average price during 1913, however, was the highest yet recorded. This would appear to indicate that the decrease in exportations was due to a failure in supply rather than in demand, and this supposition is confirmed by the data at hand in regard to the serious damage to the coconut plantations in 1911 and 1912 by severe typhoons (hurricanes) and by an unprecedented drought. The coconut palm does not produce commercially until 7 to 10 years after planting, so that recovery from the effects of disasters like these necessarily takes a considerable time. Moreover, no important copra-producing districts were freshly opened by railroad extensions, as was the case with the Laguna-Tayabas area in 1912.

The decrease in copra exports was much the greatest in those to the United States, the quantity and value of which both declined more than two-thirds. The foreign countries decreases were less marked; to France, which is a large customer, the loss amounted to 30 per cent. in quantity and 25 per cent. in value. The immediate cause for the particularly heavy falling off in the trade with the United States appears in the figures compiled in regard to average quotations per ton. For shipments to the United States the average price dropped slightly during the year—from $96.82 to $96.55—while for the total exports it rose from $97.52 to $103,03. Recovery of the supply is to be certainly predicted, though it may not be complete for several years; but whether this, in view of the apparent unwillingness of American importers to pay increased prices, will restore the trade with the United States to the figure reached in 1912, it is difficult to foretell. An increased supply may possibly bring the price down again slightly; but, as the general level has risen without material fluctuation from $45.81 in 1903 to the present record of $103.03, and the general quality of the product is undoubtedly improving, it seems rather doubtful if any such reaction in price will be a factor of importance.

Only a trifling proportion of the copra output of the islands has ever been shipped in other than a raw state, but the fiscal year just closed shows a remarkable advance over any preceding in the export of the principal derived product, coconut oil. Shipments for 1913 amounted to 1,302,275 kilos (2,871,024 pounds), valued at $315,513, as against none for the preceding year and only 63 kilos (139 pounds) for 1911. There is now a large oil factory with modern equipment well established in Manila, and it seems probable that there will be an increased tendency to retain in the islands at least this portion of the profits of working up the raw copra, which have hitherto gone chiefly to Europe.

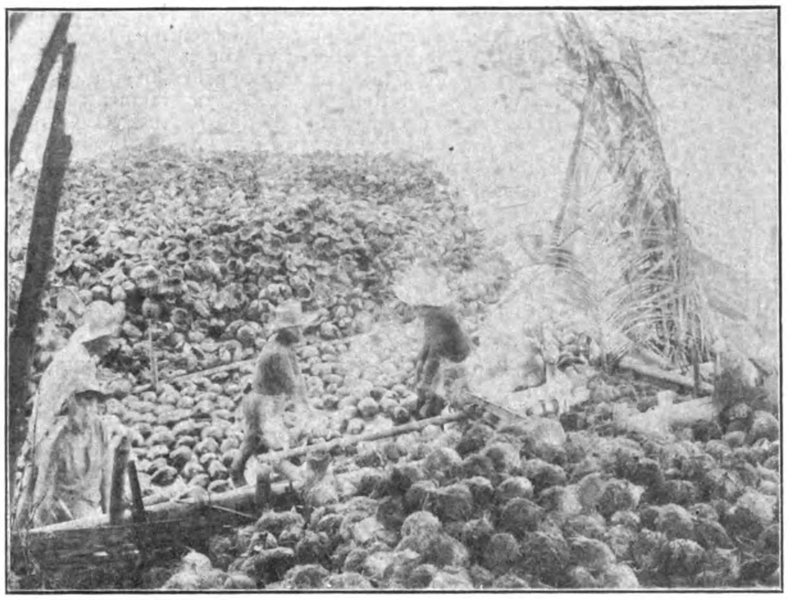
THE SUGAR TRADE

Exports of raw sugar increased in quantity from 186,016 metric tons in 1912 to 212,540 tons in 1913, a gain of 14 per cent., but owing to the poor quality of the product and the consequent low prices, decreased in value from $10,400,575 to $9,491,540, a loss of 9 per cent. The average price received per ton was but $44.66, as against $55.91 for 1912 and an average of $5.554 for the three years preceding. Low as it was, however, it was still higher than that received during any year from 1899 to 1909, the general average for that period being only $38.41. It is clear, therefore, that much of what was agined as a result of the establishment of free trade with the United States in 1909 has not been lost.

The general condition of the industry throughout 1913 was in many respects unsatisfactory. The planters were very generally in financial difficulties, which, however, were at least partially relieved at the end of the year by loans of public funds placed at their disposal by the Government through the Bank of the Philippine Islands. It should be noted, moreover, that the year has seen noticeable activity in projecting and erecting central plants for producing an improved quality of sugar, though some time must necessarily elapse before their beneficial effects will appear in the value of the export product. The effect of the untoward conditions that existed affected especially the exports to the United States, which fell off nearly one-half in quantity and more than one-half in value, and composed only 40 per cent. of the total shipments as against 85 per cent. for the preceding year. The bulk of the remainder was taken as usual by

Husking Coconuts, Magdalena, Laguna Province. Filipino plow-point in evidence as the best tool for splitting and loosening the husk 800 to 1,500 nuts can be husked per day on one of these points.

Japan, Hongkong, and China. As one result of the decrease, the exports this year fell far below the maximum quantity admitted free under the tariff of 1909. The percentage which the sugar exported to the United States formed of this maximum (300,000 tons) was 54.66 in 1912 but only 27.66 in 1913. Since, however, the new tariff of the United States does away with this maximum altogether, the question is likely in the future to cease to be of practical importance.



Coconut Husking, Pagsanjan, Laguna Province. Nuts floated to huskers who stand in water at edge of river. One man can husk about 1,000 nuts per day.

TOBACCO PRODUCTS

The exports of all classes of tobacco products showed satisfactory gains during 1913. Shipments of cigars increased in number from 175,320,000 to 207,396,000, or 18 per cent., and in value from $2,660.061 to $3,356,748, or 26 per cent. The average price received was $16.18 per thousand, the highest yet recorded; for the three preceding years the average prices were $15.17, $12.86, and $15.17, respectively; while for the period from 1899 to 1909 the highest average for any year was only $9.71. The figures for 1913 are particularly satisfactory as they show complete recovery from the slump of 1911, which followed the excessive expansion induced by the passage of the tariff act of 1909. In 1910, shipments rose suddenly from 116,000,000 to 196,000,000, only to fall to 132,000,000 in 1911. In 1912 the record of 1910 was nearly approached, but during the year just closed it was surpassed. This increase in cigar exports was nearly all absorbed by the United States, the gain in the shipments to that country almost equaling the gain in total exports.

Cultivating Tobacco, Ilagan, Isabela Province. Note the Filipino carabao plows, and the woman hand-weeding about the plants. Some of the best tobacco in the world is raised in the Cagayan Valley about here.

The quantity taken by the United States advanced from 71,973,000 in 1912 to 101,647,000 in 1913, or 41 per cent.; it exceeded that taken in 1912 and in 1911 put together, and represented a large increase over the boom year 1910; and it amounted to very nearly one-half of the total exports—the highest proportion yet recorded. The increase in value was from $1,619,326 to $2,211,340, or 36 per cent. The average price received for shipments to the United States was slightly lower than that for the preceding year ($21.76 as against $22.50), but continued higher than the average for any year prior to 1910, the highest recorded up to that time being $18.70 This slight decline was offset by the higher price received for cigars taken by countries other than the United States, so that the average price of all exports, as noted above, increased.

It is interesting to note that the opening of the American market has enabled Philippine manufacturers to secure much better prices for their cigars shipped to foreign countries as well as to the United States, though the former were in no way directly affected by the tariff changes of 1909. It should be stated, however, that, though the resultant improvement in price has been marked and continuous, there is still a conviction that Philippine exporters are not securing the remuneration the quality of their product merits. Exports of cigars to the United States during the year under consideration approached much more nearly than ever before to the maximum number (150,000,000) entitled to free entry under the tariff of 1909, but still only slightly exceeded two-thirds of it. As in the case of sugar the maximum imposed on the free admission of cigars and tobacco is removed by the new tariff.

CIGARETTES AND UNMANUFACTURED TOBACCO

Cigarettes have never formed a very important article of export from the Philippines, more than nine-tenths of the relatively enormous annual production of more than 4,000,000,000 being regularly consumed within the Islands. The increase in shipments for 1913 over those for 1912 was, however, so large in both quantity and value that the figures are of interest. Exports for 1912 amounted to 34,955,000 and for 1913 to 52,040,000, an advance of 49 per cent.; while the value increased at the same time from $32,488 to $57,582, or 77 per cent. The gain in shipments to the United States was even more marked, being nearly threefold in quantity and almost exactly threefold in value.

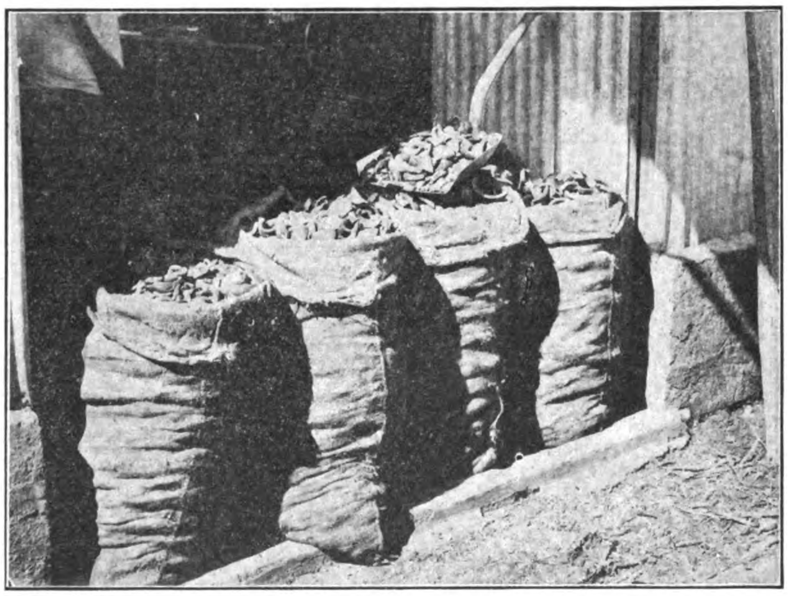
Exports of unmanufactured tobacco, which are almost wholly in the form of leaf, increased in quantity from 12,548 metric tons in 1912 to 13,309 tons in 1913 and in value from $1,902,644 to $2,039,726. Two-thirds of the shipments went to Spain, with considerable quantities to Austria, France, Hongkong, and Belgium. The United States has never taken more than a small fraction of this item of Philippine exports, and its purchases were only slightly stimulated by the establishment of free trade. The year just closed showed large relative increases, though the actual quantities and values were trifling.

MINOR ARTICLES OF EXPORT

Exports of commodities other than these great staples account for so small a proportion of the total as to demand comparatively little comment; yet there are several items which showed either considerable relative increases during the year under consideration or revealed commercial tendencies of interest from other points of view. Coconut oil has already been referred to. Exports of kopok (the so-called tree cotton which is in such increasing demand for mattresses, cushions, and life preservers) had fallen from 98,000 kilos (216,053 pounds) in 1911 to 31,000 kilos (68,343 pounds) in 1912, but advanced in 1913 to 111,000 kilos (244,713 pounds). The Philippine Bureau of Agriculture is endeavoring to encourage and assist the systematic cultivation of this novel and promising product.

Exports of abaca waste, which appeared at one time to be of great probable value for paper making, have declined steadily for two years. Exports of native cloths, which showed large increases in 1912, fell off greatly. Shipments of cordage, on the other hand—this being one of the few branches of manufacture for which the Philippines possess a considerable advantage (in the form of an abundant supply of raw material of superior quality)—reached a relatively high figure, in excess of that both for 1911 and for 1912. Exports of embroideries, shown for the first time, were valued at $195,555.

Exports of knotted abaca, the preparation of which is an increasingly important cottage industry for the peasant population of certain Provinces, declined slightly from 1912, though still far above those for 1911. Italy and Switzerland are the principal countries of destination, the knotted fiber being there worked up into hat braid. Japan has a large production of the braid, but does not import the abaca already knotted from the island, preferring to perform that process locally, using selected grades of raw abaca, for which Japanese manufacturers paid during 1913 a higher average price than any other country. Recent advices are to the effect



Copra, ready for shipping, Magdalena, Laguna Province. Bags of medium grade copra dried in steam-pipe hot-air oven. Only a few dryers of this modern type are in evidence thus far in the P. I. Value of this copra is about P.13 to P.15 per picul.

that the market for abaca braid (often called Tagal braid) is in a way to be glutted, and it is impossible to predict with certainty the future of this item of export.

HAT MANUFACTURES

Exports of hats during 1913 fell off in number by one-half, although the value was reduced only 8 per cent. This is obviously the result of a decrease in the relatively strong call for the cheaper grades, which

Copra Drying. Kiln, or Tapahan, Magdalena, Laguna Province. The common Filipino method. The smoke necessarily injures the quality of the "meat." Coconut husks and shells used for fuel.

became very marked two or three years ago. The hat trade has continually fluctuated since it first became of importance, and it seems impossible to predict its immediate future with accuracy. The manufacture of hats, however, increases in importance as a cottage industry.

The Philippines have derived little advantage from the large demand recently stimulated by some turn of the wheel of fashion for hats of the abaca or Tagal braid mentioned above; for, though the islands have a monopoly of the raw material, Japan has been enabled, by virtue of lower wages, to work up the imported Philippine product and land it, duty paid, in the United States at a price that precludes competition.

MAGUEY, TIMBER, AND RAW TROPICAL PRODUCTS—GOLD MINING

Exports of maguey increased from $320,791 in 1912 to $704,394 in 1913, more than half of this going to the United States. Exports of timber continued unimportant, though showing a slight increase over 1912. Shipments of lumber, on the other hand, which should when the valuable forests of the islands have been developed to something like the full extent of their productivity, form a very important item, showed a gratifying increase from $63,455 to $214,814, or 238 per cent. More than half of the total went to the United States. Nearly one-half of it was represented by the native timber known as tanguile, a moderately hard and heavy wood of fair durability, useful for general construction, paneling, and furniture.

Exports of certain agricultural products, for the growth of which the Philippines are eminently adapted by nature, such as cacao and a large variety of fruits, remain negligible. In addition to all these there are regularly exported from the Philippines varying quantities of a number of raw tropical products, mostly from the sea or the jungle, which are not mentioned separately, as the unsystematic nature of the methods by which they are collected—in most cases by the casual labor of the uncivilized tribes—causes their quantity and quality to fluctuate greatly. Such are pearls, pearl shell, certain vegetable oils, gums and resins, beeswax, bêche-de-mer, gutta-percha, sapan wood, and rattan. Some of, these, at least, are probably capable of systematic exploitation at a profit by the use of more intelligent methods and the application of a little capital.

Now that the period of experimentation in utilizing the gold resources of the islands appears to be over and several plants are producing extensively, the exports of gold bullion should be mentioned, here, although they are not included in the total exports as given at the beginning of this report. Regular shipments commenced in 1912, and amounted during that year to $77,849; during 1913 they reached $729,503; and all indications are for a further increase during the present fiscal year (1914).

CHANNELS OF TRADE—AMERICAN PRIMACY

In dealing with the principal items of export and import something has in each case been said as to the countries which appear most prominently as sources of supply or as destinations, and especially as to the relative position in this regard of the United States. In the way of discussion of the general subject of channels of trade, therefore, no more is necessary than to comment upon a few salient points by way of summary.

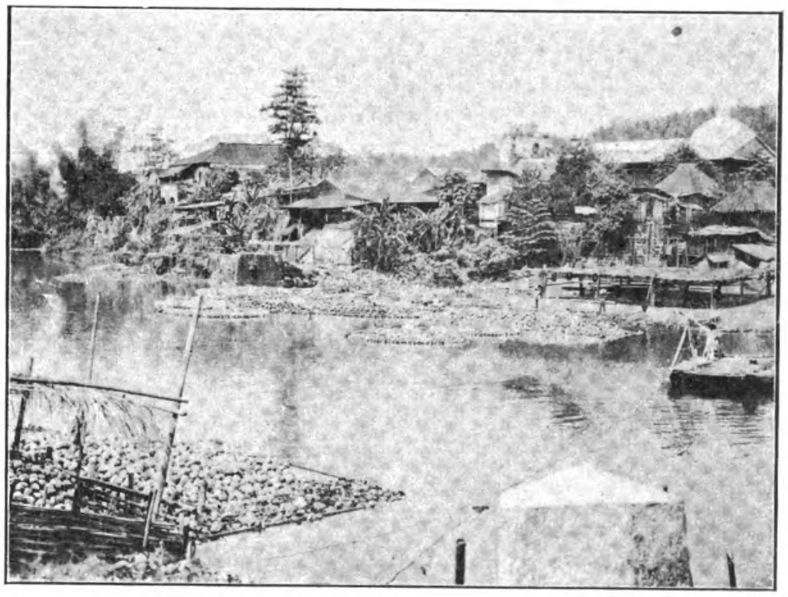
The United States continues to maintain the primacy in Philippine trade, both as purveyor and customer, which was gained in 1910 as the result of the tariff legislation of the preceding year. During 1913 the United States took exports valued at $19,970,642, or 37.2 per cent. of the total, as against $21,619,686 in 1912; and supplied imports worth $25,646,875, or 45.5 per cent. of the total, as against $20,791,433 in 1912. Exports to and imports from the United States for 1913 amounted to $45,617,517, or 41.5 per cent. of the total trade of the islands. This last percentage is much greater than that for any year prior to 1910, and also greater than that for that year (38.5 per cent.) or for 1912 (40.4 per cent.), but smaller than that for 1911 (43.1 per cent.) The percentage of total imports supplied by the United States is the highest yet recorded, the percentages for the three years preceding being 29.1, 39.8, and 38.1, respectively, while for no year prior to 1910 did it reach 20 per cent. In fact, the increase in imports from the United States during 1913 ($4,855,442) was greater than the total increase in imports from all countries ($1,777,533). Besides the commodities already mentioned, such as cotton goods, flour, iron and steel products, and leather goods, the principal classes of merchandise which contributed to this great increase in import values from the United States were automobiles, fish and fish products, and silk goods.

In exports to the United States during the year under consideration there was an absolute decrease of 7.6 per cent., and the percentage which these bear to the total exports, as given above, was less than for any year since 1909 and even for one or two years previous thereto. This falling off was due to the decreased purchases of sugar and copra already discussed; and what was said in that connection applies also to the question of remedying the situation now under discussion. It depends, of course, in part on the recovery of those industries from the effects of storm and drought, in part on the reappearance of a demand in the United States for Philippine copra at probably increasing prices, and in part on the adopiont of improved methods of treating the sugar crop.

POSITION OF OTHER COUNTRIES

The United Kingdom occupied during 1913 second place as regards total trade and exports and third (after French Indo-China, whence come the heaviest rice shipments) as regards imports; in all three cases with France immediately following. This has been, since the establishment of free trade with the United States, the normal situation, although in 1910 and 1912 France, being a heavy purchaser of Philippine copra, stood above the United Kingdom on the export list. During 1913, however, there was an increase in the total trade with the United Kingdom (mainly in exports as a result of the increased value of abaca shipments), while the total trade with France, principally owing to the shortage in the copra supply, declined. French Indo-China continued to stand fourth in regard to total trade, despite the decrease in importations of rice; that colony's share in the Philippine export trade is negligible.

Aside from these countries, a study of Philippine trade figures for several years has demonstrated that changes in the relative standing of Japan, Germany, Spain, China and Hongkong, Australasia, the British East Indies, and such others as from time to time make a noticeable figure in the returns, are so frequent and so seldom traceable to any definite cause as to



River at Pagsanjan, Laguna Province, showing coconut raft. This town is a famous center for copra and coconut oil manufacture. The unhusked nuts are floated down the river in rafts.

make it unprofitable to comment on them at length. During the year under discussion the British East Indies lost relatively as the result of diminished rice purchases from Singapore and Rangoon. Japan, though losing heavily to the United States in the cotton-goods trade, rose in the list as the result of taking large shipments of high-grade abaca and of sugar; and China and Hongkong also assumed higher places as the result of increased purchases of the latter article.

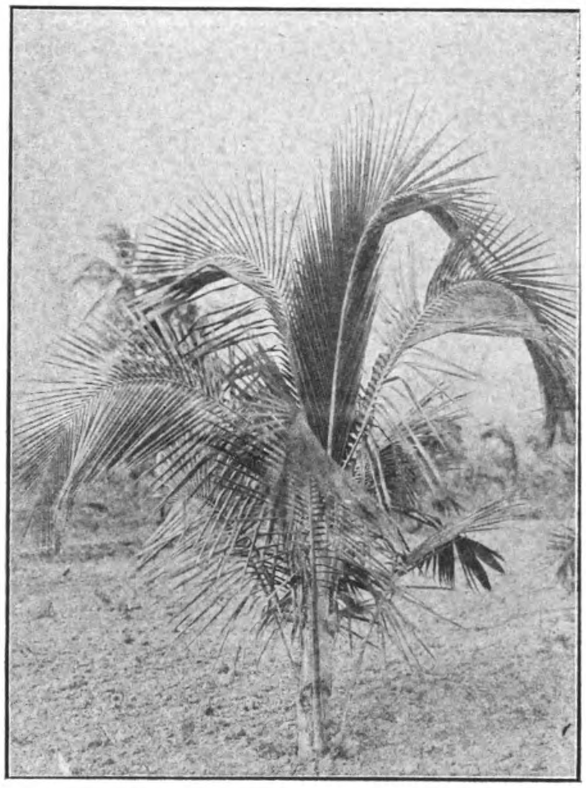
GENERAL SUMMARY

The course of Philippine trade for the fiscal year 1913 may therefore be summed up as follows: The total volume showed a moderate increase, somewhat smaller than estimates based on the figures for the first few months, but still satisfactory; this increase was about equal in imports and exports, excluding from the former the item of rice, purchases of which, owing to an abundant local harvest, largely declined. Aside from rice there were satisfactory increases in the importations of most classes of merchandise. In cotton goods there was a large advance, more than absorbed by the United States, which now supplies nearly 60 per cent. of this class of Philippine imports. There was also a considerable gain in the imports of iron and steel products, mainly in machinery, in which the United States also shared largely.

Of the great staple exports, abaca (Manila hemp) declined in quantity, but advanced in value, owing to a sudden and possibly only temporary rise in price. Copra and sugar decreased in both quantity and value, and especially as regards shipments to the United States; in the former the main cause was a shortage in supply due to typhoons and drought, and in the latter, the poor quality of the product. Tobacco products, especially cigars, showed very material increases. Minor items of export fluctuated a great deal, the most satisfactory feature being the appearance of a considerable export of coconut oil. Exports of gold bullion from Philippine mines, not included in the total figure as usually given, increased heavily.

The United States retained its primacy among countries having shares in Philippine trade, as regards both exports and imports. The United States took a slightly smaller value of exports than during the preceding year, but made a heavy gain in its share of the import trade, both absolutely and relatively. As a result its share of the total trade increased materially. There were no changes of importance in the standing of other countries.

[All the photographs used to illustrate this article are by the Bureau of Agriculture, Philippine Islands.]



One-year-old Coconut, Pataion Estate, Zamboanga, Mindanao. This plant has, of course, been properly treated, i.e., kept free from grass and weeds, and well tilled. (About three times the ordinary growth.)

RECENT DISCOVERIES OF COAL IN JAPAN

In reference to recent discoveries of coal in Japan the American Vice-Consul at Nagasaki, Mr. Harold C. Huggins writes:—Recent surveys made at Iojima (an island in Nagasaki Harbor) have confirmed the opinion of experts that a valuable deposit of coal exists there. Its quality is said to be the same as that of the Takashima colliery coal, and in quantity it is thought to equal the Nakanoshima field near Nagasaki. If this deposit proves as valuble as it is supposed to be, Nagasaki will be most fortunate in having an abundant supply of fine coal near the entrance of its harbor, and local business circles anticipate a revival of prosperity as the result of the opening of this mine.

The Takashima coal mine, referred to above, is the generic name of the two collieries located at Takashima-mura and Hashima, Takahama-mura, both in the Province of Hizen, Nagasaki Prefecture, and owned by the Mitsu Bishi Kaisha, and although this company has been working continuously day and night for the last 32 years, the area mined so far is hardly one-third of the total area of the remaining field. Takashima, Futagoshima, Nakanoshima, and Hashima are the four principal islands of the coal field.

The coal deposits of the Mitsu Bishi Co. to be worked in the future are those of the Nakanoshima field and the field lying between Nakanoshima and Takashima.

PROMISING MINE NEAR SASEBO

A very promising coal mine has been discovered near Sasebo Naval Station, Sasebo, Hino-mura, Nagasaki Prefecture. It is estimated by those who have examined the outcroppings and seams that the workable area exceeds 4,280 acres. The mine abuts on the seashore, and outcroppings of the seams may be seen in the sand. Work will shortly be begun on this mine, and it is expected that this district (Sasebo) will, as a consequence, become very prosperous. The quality of the coal is said to be equal to the famous Miike coal.

As Sasebo has no direct rail connection with Moji or with Nagasaki, and is, by water, nearer to Nagasaki than to Moji, it will be cheaper and more convenient to ship this coal to Nagasaki for export than it will be to send it to Moji, the present great coaling port of Kiushu. This fact, in connection with the discovery of workable deposits of coal on Iojima, will give a great impetus to the already well-started improvement of the commercial condition of Nagasaki. It is quite possible that this mine will soon be controlled by either the Mitsui Bussan or the Mitsu Bishi Kaisha, as all the important mines in Kiushu have passed into the hands of one or other of these companies by purchase or through contracts.

There is a growing tendency to favor American machinery in the Kiushu coal mines. Companies desiring a share of this business may be able to obtain profitable orders by personal representation there. In such a badly crowded, highly competitive field it is useless for any firm to expect consideration for goods not known to the buyer, and not properly brought to his attention.

NIPPON YUSEN KAISHA TO CHANGE COALING BASE

These discoveries of coal in the vicinity of Nagasaki lend additional interest to the Nippon Yusen Kaisha's announcement of its intention to abolish its coaling station at Moji and to establish a base for its European, Indian, and Australian lines at Nagasaki. Moji's position in Shimonoseki Straits at the entrance to the Inland Sea makes it a more convenient port of call than Nagasaki for vessels bound to China, the East Indies, and Europe; and, too, its proximity to the great Chikuho coal fields is of great benefit to Moji, the cost of transporting this coal to Nagasaki making it prohibitively high in this port.

But these advantages of Moji as a coaling port have been counter-balanced by its unsuitability as an anchorage, due to the swift current through Shimonoseki Straits, which has caused numerous collisions of vessels. It was in order to avoid all danger of such accident to its new boats that the Nippon Yusen Kaisha decided to remove its coaling base from Moji, and it has been considering the change to Nagasaki for some time, but was deterred by the price of coal here. With the working of the deposits at Sasebo and Iojima, Nagasaki will have available an abundant supply of good fuel and should soon be able to furnish coal as cheaply as Moji. Transportation to Nagasaki from Sasebo and Iojima will be by boat, whereas the coal supplied to Moji is all carried to that port by rail—a more expensive method of transportation.

MINING RIGHTS IN MONGOLIA

A Harbin correspondent writes:—Near Manchuria Station is a town named Lupingfu, itself in Barga territory and not far from this town is a coal mine which, prior to Outer Mongolia's declaration of Independence, was worked by Chinese. These cleared out when fighting began, leaving in charge a handful of watchmen to look after the plant which included a considerable amount of machinery. As is usual all over China, movable fixtures were stolen and even the timber in the shafts was taken away for use as firewood. An Italian who knew this mine previously obtained a concession from the Mongolian authorities to work it on his own account. When he arrived with his credentials and took charge he found the mine full of water and only the heavy machinery left intact. He at once set to work in an energetic manner to restore order, is producing coal of a marketable quality which is readily saleable and has proved that the mine is of considerable value. Now that the mine promises to become a paying concern, rumours are afloat that objections will be raised against the Italian's right to work it. Provided that the Italian's papers are in order and the Mongolians owned the land on which the mine is situated, these objections cannot be treated seriously by the Mongols.

It is just this sort of thing that makes it impossible to embark on any form of mining enterprise, and the sooner the Chinese and Mongolian authorities realize this and do away with the uncertainty at present attaching to mining rights, the better.

RUSSIAN WIRELESS SERVICE IN SIBERIA

The Russian Government has under consideration the establishment of seventeen wireless telegraph stations. The first thing to be done is to found a central station at Nikolaievsk so as to communicate with a branch station at Okhotsk and two other places in order that communications between the Behring Straits and European Russia may be raised to a more efficient and reliable working basis. Branch stations will be opened at the mouths of four rivers in Siberia emptying themselves into the Arctic Ocean.

MOTOR CARS IN NORTH MANCHURIA

Motor car traffic between Tsitsihar (in Heilungkiang) and Taheiho, 330 miles distant, has been opened with six motor cars which are at present employed chiefly for carrying passengers. The fares are 27 roubles, 16½ roubles, and 9 roubles for 1st, 2nd, and 3rd classes respectively. This enterprise is financed on joint government and private capital.

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CHINA'S NEW MINING REGULATIONS

We are now enabled to publish the new regulations which the Chinese Government has devised and promulgated. They are a distinct advance upon anything else of the kind that have been adopted in the past, and afford tangible evidence that the Government is desirous of doing more for the development of the most important of her natural resources than has ever been done by any previous régime. While there are foreign critics who express apprehension lest the regulations will still be used in an obstructive sense so far as the introduction of foreign capital is concerned, the officials directly connected with the administration hold a different view and give expression to more reassuring sentiments. They are in fact enthusiastic that the regulations will prove fully adequate in their scope to permit the untrammelled entry of foreign capital and will at the same time accord the fullest meed of protection to investors. The one thing that must be acknowledged is that the regulations are a tremendous step forward. In the old days—not so very old as measured by time—the mining industry was throttled by mismanagement and over-taxation by the officials, and was obstructed by the people, whose superstition led them to believe that the boring of a hole in the crust of the earth presaged the release of a disgruntled dragon which would wreak more damage in the immediate locality than the opening of half a dozen Pandora's boxes. The "industrial delegates" who used to be despatched to the provinces specially to take charge of mining affairs knew nothing of their work, and the Taotais to whom the task was eventually passed on knew less. There was no possibility of development under such conditions, and scarcely anyone endeavored to pursue the establishment of a mining enterprise to the end. The history of several concessions granted to foreigners are too well known to need repetition. Work was prevented by people and officials—and China repurchased the concessions at high prices, and then did nothing with them. That day seems to have passed so far as the Central Government is concerned, but whether the attitude of the people has changed can only be tested by an effort to carry on development work. In order adequately to administer the mining country eight districts have been created with responsible heads. Attached to each will be technical experts, Chinese and foreign, who will be chosen on account of special qualifications and whose duties will be connected entirely with the prospecting, location, and development of mineral deposits.

A change, too, has been made in connection with the acquirement of mineral lands. Under the old régime the owner of the surface land was the proprietor of the ores beneath, and every manner of extortion was practised to obtain money from those desirous of mining Large sums have been squandered by mining concerns in acquiring the permission of the landowners to work, with the result that before proper development could be undertaken capital has petered out and enterprises have been abandoned solely for want of unlimited funds. Mineral deposits are now, however, declared as belonging to the State, and the landowner is unable arbitrarily to demand payment in any shape or form, except for land which might be required for buildings, and even then he will be compelled by the Government to accept the market rate of the day, provision being made for an appeal by the mining applicant to the head of the "Bureau of Mining Supervision" of the district in case of suspected extortion. This gives distinct encouragement to prospectors who hitherto have located deposits, for it is now possible for them to secure a right to mine irrespective of any claims the landholder may make, and providing that no other mining claim can be sustained. The area granted for mining has also been somewhat increased. In the old régime the largest area was 960 mow (a mow being 7,260 English square feet) but that has now been increased to 10 square li (a li being approximately one-third of a mile), in the case of coal mines, and to five square li for other mines. Any mining company having legitimate grounds for extension may, however, apply to the Minister of Commerce and Industry for such a right, and he is empowered to grant it if he thinks advisable.

A revision has been also made of the taxes which in the old days were imposed and strangled the industry. Gold, silver, and precious stones could not be worked under a tax to the Government of ten per cent., while five per cent. on the output of other

minerals had to be paid. In addition to that, too, half of the profits of the mines had to be divided equally between the Government and the owner of the land, the other half going to those who had developed the property. In view of this it is not to be wondered at that mining enterprises never flourished in China, and it is gratifying to note that the Government has now seen the wisdom of making the tax a nominal one of from one to one and a half per cent. of the product of the mines.

The vital point so far as the foreigner is concerned is that of financial participation, and in this respect there has been a more liberal view taken of the requirements of foreign capital. In the old days foreign capital was restricted to forty per cent. of the total, and every effort was made to prevent foreign direction of mining properties. The participation has now been placed at fifty per cent., but we have it on the authority of both the Minister of Commerce and Industry, and the head of the Mining Department, that foreigners may provide whatever portion of the capital is necessary if the Chinese fail to subscribe their moiety. Further, the question of control will rest with the mining company entirely, and there will be no restriction with regard to the purchase of shares on the stock market by foreigners. If this procedure is carried out in spirit there is much more certainty of foreign investment than heretofore, though large capitalists will hunger for concessions which will permit them to handle big schemes either with participation of Chinese capital or without.

On March 11 the important announcement was made that Professor Anderson, Director-General of Mining in Sweden, had been appointed Mining Adviser to China. This appointment is held in some quarters to be a guarantee that the Mining Regulations will be administered in a liberal spirit, as it is understood that Professor Anderson only consented to accept the appointment on the understanding that the old policy of obstruction to mining development should be abandoned.

"THE RICHEST COUNTRY IN THE WORLD"

Visitors to the Philippines with singular unanimity remark that the country has wonderful possibilities. The ordinary globe-trotter, perhaps, pays more attention to scenic beauty and to the picturesque than to the commercial possibilities of the countries he visits, but the Philippines of late years have attracted a number of men who were well fitted by training and natural instinct to determine, even after a short stay, whether the Archipelago showed much prospect of expansion. Mr. William Kline, the well-known Chicago millionaire, falls within the latter category. Interviewed recently at Manila after a stay of a few weeks in the Islands, he declared that the Archipelago was "the richest country in the world." He had no patience with those who talk pessimistically of the future of the Philippines. In his opinion the merchants of all nationalities should "get together and boost the country." Also, he counselled, they should drop politics and give greater attention to attracting tourists.

It is at all times useful to get the candid and unprejudiced opinions of those whose views are worthy of respect. The successful business man upon visiting a new country looks around him with an understanding eye; he considers geographical position, political conditions, natural resources, climate and all the elements which combine to render the prospects favorable or unfavorable. In the case of the Philippines it is, as we have said, remarkable that the men best qualified to judge are unanimous in declaring that an ever-growing prosperity should be the lot of the country. Mr. Kline's advice to drop politics is worthy of consideration. Politics necessarily play a great part in the life of a country, but it is possible to over-estimate the importance of that part, and to allow apprehensions based on political beliefs to interfere unduly and disastrously with normal progress. While it would be untrue to say that politics is the fly on the wheel, politics is certainly not the wheel, and the mistaken belief that it is is responsible for fears that are not well founded.

A study of the valuable article by Mr. John R. Arnold published elsewhere, will show the wonderful progress being made in the Philippines. Some of the figures quoted are veritably astounding. For example the value of the abaca (Manila hemp) exported rose to the extraordinary total of $23,044,744, an increase in comparison with the previous year of nearly $7,000,000. This great increase, it is true, was due to the rise in price and not to increased production, but there seems no reason to suppose that the price will sink very far below the present level. On the other hand the production is certain to increase as the decrease in 1913 was entirely due to the unfavorable climatic conditions of the previous year. The tobacco industry also showed gratifying progress, the value of cigars exported alone showing an increase of 26 per cent. Natural conditions accounted for a falling off in copra and sugar, and this need occasion no alarm. The imports only increased in value by about 3¼ per cent. and the exports by over 6⅔ per cent. That the increase in the value of imports was so small is a matter for congratulation, as it is mainly accounted for by the large drop in the importation of rice. The attainment of the ideal position when the Philippines will supply all its needs in foodstuffs will obviously be to the advantage of the country as a whole, though it must naturally adversely affect in appearance the trade statistics.

We feel sure that the optimists are right, and that Mr. Kline's advice is well worth following. The development of a belief that the Philippines must progress whatever happens in the political world would help to hasten that progress. Nothing was ever yet accomplished by insistence upon looking only on the gloomy side of things. The profitable course is to be optimistic even in adverse circumstances, and to be pessimistic when it is obvious that circumstances are favorable is the height of unwisdom.

SHANGHAI'S MUNICIPAL ELECTRICTY DEPARTMENT

On March 20 the Ratepayers of Shanghai, amid great enthusiasm, rejected a proposal to hand the Municipal Electricity Department over to a private company. The proposal followed the presentation of a report by a Special Committee, which recommended that the Electricity Department should be handed over to a company in which the Municipal Council should retain a sufficient number of shares to ensure control of the management by the Council. At least one half of the shares should be held by the Council. It was further recommended that stipulations should be made in regard to the tariff of charges, including that for public lighting, and to ensure that no increase in rates should be made without the Council's sanction. A capital of Tls. 6,000,000 was suggested. The reason given by the Special Committee for recommending the handing over of the Department was, briefly, that the necessary extensive borrowings for the Department tended to fetter the issue of Municipal loans for general purposes. In a reference to the Special Committee's report in the *Municipal Gazette* it was said that one object in view in appointing the Committee was the desire, wherever expedient, to divest the Council with its limited membership of nine of some part of its increasing responsibilities.

To the report were appended other reports by the Municipal Electrical Engineer and the Municipal Treasurer. The former was strongly in favour of handing over the Department to a Company. The lack of elasticity in Municipal enterprises was cited. The Council at present only received from the Department the small sum of Tls.26,000 per annum. Owing to its municipalisation the undertaking could not be run in such a way as to offer such facilities to the public as would induce it more generally to adopt electricity. The Council upon its holding of shares in the company would, on an 8 per cent. basis, receive Tls.60,000 profit instead of Tls. 26,000. The Municipal Treasurer also supported the proposed transfer to a company on three grounds, (1) that a practical solution to the question of the redemption of Electricity loans—for which no provision had yet been made—would be provided, (2) that the Council would be relieved from the many details attendant on the management of a large and constantly expending industrial undertaking (3) that the finances of the Municipality would be greatly strengthened. The Treasurer pointed out that the loans already issued for Electricity purposes amount to Tls. 2,719,000. To provide for interest and repayment over a

period of thirty years would involve an annual charge of about Tls.197,500. A dividend of eight per cent. on the Council's shares, say Tls.3,500,000 would produce Tls.280,000, which after deducting the Tls.197,500 required for interest and redemption would give a balance of Tls. 82,500 for transfer to Municipal income. At the end of thirty years the income of the municipality would benefit to the extent of a clear Tls. 280,000 per annum.

The report of the Special Committee did not meet with the unanimous approval of the Council. In fact it soon became known that a majority of the Council were opposed to the transfer, and the Press and public seemed entirely averse to making the suggested change. The rejection of the proposal that the Electricity Department should cease to be a municipal enterprise, by an overwhelming majority of the Ratepayers, excited no surprise, but it was generally admitted that it was desirable to give more elasticity to the administration. Important extensions of the Riverside Power Station are contemplated, and the sum of Tls. 700,000 for additional plant was voted.

REPRESENTATION FOR BRITISH MANUFACTURERS, LTD.

An interesting and important development, and one which may be regarded as significant, is the establishment in China of Representation for British Manufacturers, Ltd. This Company was recently founded by nine well-known firms for the express object of establishing and maintaining staff representation in certain foreign countries for the sale of their manufactures. The founders were Sir William Arrol & Co., Ltd., Glasgow; John Brown & Co., Ltd., Sheffield; Cravens Limited, Darnall, Sheffield; Dorman, Long & Co., Ltd., Middlesborough; Thos. Firth & Sons, Ltd., Sheffield; R. W. Hawthorn, Leslie & Co., Ltd., Newcastle-on-Tyne; Hulse & Co., Ltd., Manchester; W. S. Laycock, Ltd., Millhouses, Sheffield and Simon Carves Coke Oven Co., Ltd., Manchester.

The East Asiatic Section of the Company is now being organised. There will be a head office at Peking and branch offices at Shanghai (which was opened in February), Hankow and Canton. Business in Eastern Siberia, Mongolia, Manchuria, Korea and the provinces of Chihli, Shansi, Shensi and Kansuh will be attended to by the Peking office, while the spheres of the other offices will be as follows:—Shanghai office: Shantung, Kiangsu, Anhui, Chekiang and Fukien; Hankow office: Honan, Hupeh, Kiangsi, Hunan, Kweichow and Szechuan; Canton office: Kwangtung, Kwangsi, Yunnan, Hongkong, Formosa and the Philippine Islands.

The Company is not a trading company; that is to say it does not exist to make profits for itself. Business will be negotiated for account of and in the names of the respective manufacturers. The Company desires to facilitate business with the existing commercial houses, whilst keeping the names and tradesmarks of the manufacturers who hold the shares, prominently before the users.

The organization in China is being carried out by Mr. W. Franklin Newman, General Manager, and the Assistant General Manager is Mr. S. W. B. Mc.Gregor, A.M. Inst. C.E., M.I. Mech. E.

VLADIVOSTOCK HARBOUR EXTENSION.

Engineer F. N. Gezekhus, the Assistant Harbourmaster of Vladivostock, is engaged in completing the details of the project for the extension of the commercial port and in making the necessary arrangements to let out the work on contract. He reports that the Ministry of Trade and Industry has already drafted the contract and that it will publish the advertisement for tenders after negotiations have been conducted with the city concerning the grant of the requisite lots of land along the shores of the harbour. It was expected that the result of the tenders would be made known about the end of March, or according to the New Style of reckoning, during the early part of April.

Independently of the foregoing, negotiations are being conducted with the War Department on the exchange of lots necessary for the extension of the port. The Imperial Duma has appropriated for this important work, under the Law of July 12th, 1913, about R. 6,750,000 (£675,000), which includes the sum of R. 300,000 (£30,000) for the construction of a floating dock. Work let out on contract will represent a value of something like R. 5,500,000 (£550,000). It has been decided to carry out the dredging operations under official supervision, and the Ministry has therefore ordered from Holland a complete dredging plant, which is due to arrive at Vladivostock, towards the end of 1914.

IRONWORKS IN SHANTUNG

A board meeting of the Shantung Railway Company recently considered a proposal for the establishment of iron works in the German Protectorate at an estimated capital outlay of m.10.000,000. It was resolved to propose that for this purpose the share capital should be increased by m. 10,000.000 (to m.70,-000,000). It is intended that for the first three years a 5 per cent. dividend out of capital shall be paid on the amounts paid up.

SHIPBUILDING IN CHINA

A smaller aggregate tonnage was launched in 1913 at the Shanghai shipyards than in 1912, but the establishments continued fairly busy with the construction of river steamers, lighters, tugs, and small craft generally. The New Engineering Works are building a river steamer, two tugs, two motor barges and two steel lighters; while the Shanghai Dock Company have on hand a steam collier of 6,000 tons, a twin-screw river steamer, a salvage tug which is to have engines of 1,200 I.H.P., other two smaller tugs, and a passenger tender. The yards of course are all comparatively new, but they are extensive, and some of them do a great deal of drydocking and overhauling business which does not figure in statistics of tonnage launched. They were, indeed, started as repairing and overhauling establishments, but it was found that new construction could be economically combined with this. The firms still, however, specialise to a large extent in their original line of work.

	1913.			1912.	
	Ves.	Tons.	I.H.P.	Tons.	I.H.P.
Shanghai Dock Co.	12	4,025	350	4,023	2,700
Kiangnan Works	21	3,239	1,840	6,164	3,000
New Eng. Works	20	1,093	40	2,870	1,660
The China Eng. Co.	7	130	—	—	—
	60	8,487	2,230	13,057	8,260

The Shanghai Dock and Engineering Company.

Vessel and Type	Registry	Tons	I.H.P.
Slavianka-Tug	Vladivostock	100	350
Laestrygon-Pontoon	Shanghai	3,000	
9 vessels-Lighters	„	675	
1 vessel-Barge	„	250	

Total-12 vessels of 4,025 tons and engines of 350 I.H.P.

Kiangnan Dock and Engineering Co. Shanghai.

Vessel and Type	Registry	Tons	I.H.P.
2 vessels-Steamers	Tientsin	543	1,350
6 vessels-Steamers	Shanghai	150	400
7 vessels-Motors	„	218	—
3 vessels-Lightships	„	90	
3 vessels-Pontoons	„	358	
1 vessel-Hulk	„	1,880	

Total-21 vessels of 3,239 tons and engines of 1,840 I.H.P.

The New Engineering Works, Shanghai.

Vessel and Type	Registry	Tons	I.H.P.
Chi Yue-Steam launch	Shanghai	15	40
Soo Hang-Motor Barge	„	30	—
4 vessels-Motor launches	„	23	—
2 vessels-Motor tugs	Vladivostock	25	—
12 vessels-Barges, lighters, etc	Shanghai	1,000	

Total-20 vessels of 1,093 tons and engines of 40 I.H.P.

The China General Engineering Co., Shanghai.

Vessel and Type	Registry	Tons	I.H.P.
7 vessels-Motors	Not stated	130	—

NEW RAILWAY STATION AT CHANGCHUN

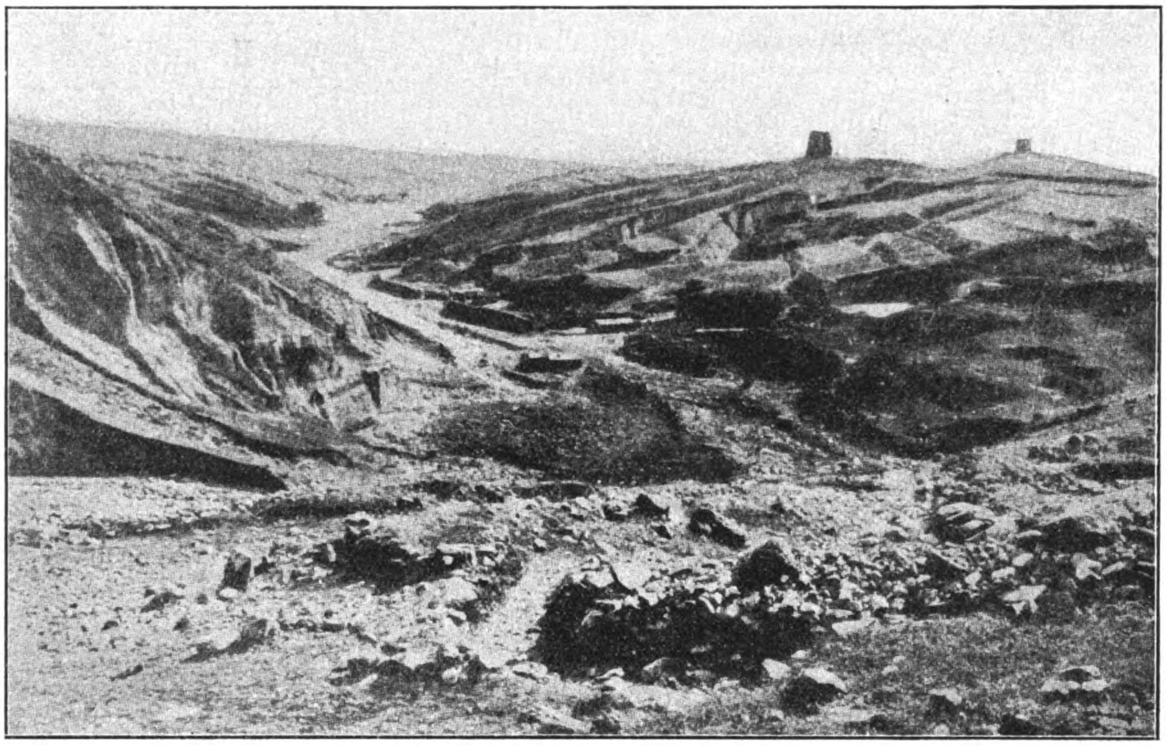
The mild winter greatly accelerated the progress of the construction of the new Railway Station at Changchun, for which about Y.300,000 is laid out. The work was quite completed by the end of February, and the building is to be taken over shortly by the South Manchuria Railway Company from the contractor. The interior furnishing, installation of electric wiring, etc., will be finished during April, and the new premises will be ready for occupancy at the end of April. The new building is said to surpass in dimensions and architectural elegance even the Mukden Station Building, part of which is used as the Yamato Hotel.

THE CONTROL OF INNER MONGOLIA

PROJECTED RAILWAYS NORTH OF PEKING

The lessons on the value of railway communication which the Chinese Government have learned in the troubles which have beset the country during the past few years have been instrumental in firing the authorities to endeavor to bind the region known as Inner Mongolia closer to China Proper by the establishment of a series of lines connecting the newly opened "ports" with Peking. The miniature frontier war which developed between the Mongolian and Chinese forces as a result of the unrest in Mongolia demonstrated to the officials in Peking the slender character of the hold they had upon the rich regions lying outside the boundaries of the northern provinces, and prompted them to seek some other means than armed force to win the allegiance of the inhabitants, and secure a better footing to resist the invasion of possible enemies from across the Gobi Desert.

Frankly put, China feared the Mongols, but feared more the friends behind them, and she followed wise advice when she made the anticipatory move of opening certain towns in Inner Mongolia to foreign trade, thus giving other nationals a footing in tracts erstwhile forbidden from the China side but which were, from the Mongolian side, rendered a happy hunting ground for any Russian traders who might feel disposed to take advantage of it. That few did do so, has little bearing on the question. That the privilege existed, and that the jurisdiction of China over the region was seriously menaced, are facts which are common knowledge and which have compelled the Chinese Government seriously to consider the situation from its several view points. What is appreciated now is that lack of communication is the greatest handicap to any successful reassertion of authority on the disturbed Mongolia tableland, and to overcome that there is considerable thought being devoted to the initiation of a railway scheme to provide facilities which will bring the rule of Peking into respect among the settlers and the nomads who seem to have lost all idea of the fact that Peking pronouncements are to be regarded as anything more impressive than exhibitions of official aptitude with the brush or as purely mural decorations.



The main route from Kalgan to Mongolia—Looking towards Kalgan

The opening of the towns of Kweihwating, Kalgan, Dolonor, Chih-feng, and Taonanfu, in Inner Mongolia, was designed to give foreign traders certain commercial claims in the event of some untoward development in Mongolia, and the connection of these towns by rail will not only enhance trading possibilities, but will achieve the end which Peking has in view. The scheme which is talked of and which the Government hope will soon be developed embraces a wide area of country, as will be seen from the accompanying map. It is proposed to construct a line from Peking to Jehol and Chih-feng first; to follow that with a line from Chinchow, on the Peking-Mukden railway, to Chaoyang, and later to connect Chaoyang with Chih-feng; then to build a railway from Kalgan to Dolonor, and a connecting link with Chih-feng. Such a programme will bring an important section of the country under the immediate domination of the Capital, and will immensely commercially benefit a wide expanse. Practically the whole of the region tapped is rich from a pastoral point of view, and much of it is exceptionally good for grain production Avenues will be opened for large settlements, and the overpopulated areas in China Proper might easily be relieved of heavy surpluses to the benefit of Inner Mongolia. The Government have no misgivings about setting about the building of all of these lines at once, but financial stringency dictates a gradual programme of construction.

In all there would be about 800 miles of railway to be built to consummate the scheme, the approximate mileage being made up as follows:—

Peking to Jehol	140 miles
Jehol to Chih-feng	130 "
Chinchow to Chih-feng	180 "
Kalgan to Dolonor	150 "
Dolonor to Chih-feng	200 "
Total	800 miles

The connection with Taonanfu is not being considered in this scheme, the section between that city and Jehol having been promised to the Japanese to finance and construct. That is likely to be deferred for some time, for the Government feels that that particular line would contribute more to the strategic and commercial plans of Japan than it would to those of China. For that reason China intends to devote herself to securing the regions about her northern frontier, and as a beginning proposes to build the line northward from Peking for strategic reasons, and from Chinchow to Chaoyang for commercial ones. Chaoyang is the centre of a wealthy mineral area and the development of the latent riches is bound to take place immediately the question of transportation is solved. This line will be constructed as a branch of the Peking-Mukden railway, and probably from money loaned by the British and Chinese Corporation if sufficient earnings are not obtainable from the Peking-Mukden railway. The line from Peking to Jehol and Chih-feng will have to be built from loan money, but whether, it will be entirely British or not remains to be seen. Diplomatic strings have to be pulled to obtain a modification of the Scott-Muravieff agreement which precludes Great Britain from aiding any of her nationals in seeking railway concessions outside the Great Wall, and whether Russia will consent to such a modification is a moot point. The importance of such a system of railways is not lost upon the Mongols of Urga, or the Russians, and both have peculiar interests of a vital nature to preserve. The proposed lines are not calculated to assist either in that direction, so it is reasonable to suppose that both will use all possible efforts to throw obstructions in the way of their materialisation. The professions of friendship for China which Russia recently felt constrained to make when she advocated the withdrawal of foreign garrisons from North China might be, of course, strikingly signallised by a helping hand being extended now that China is wishful of establishing herself so that she can rule the turbulent tribesmen who have cost her so dearly in recent months. If it is, Russia will do much to remove the impression that has gained ground that she is the motive power behind the machinations of the Mongols, but if she does not she will merely strengthen the arguments that are adduced to prove that she has deep-laid plans for territorial aggrandisement at the expense of China.

Already China has evinced a desire to have the railways alluded to built by having had both the Chinchow-Chaoyang, and Peking-Jehol lines surveyed, Mr. D. P. Ricketts, Engineer-in-chief and General Manager of the Peking-Mukden railway, having conducted the work. The estimated cost of the Peking-Jehol line is set down at approximately £1,169,900, while that from Chinchow to Chaoyang is given at about $4,225,000, or, roughly, £422,500.

It is, of course, declared that a line to Jehol alone will not pay; but if a continuation is made to the market town of Chih-feng it is safe to assume that there will be more than sufficient traffic developed to cover working expenses and capital charges in very quick time, for that

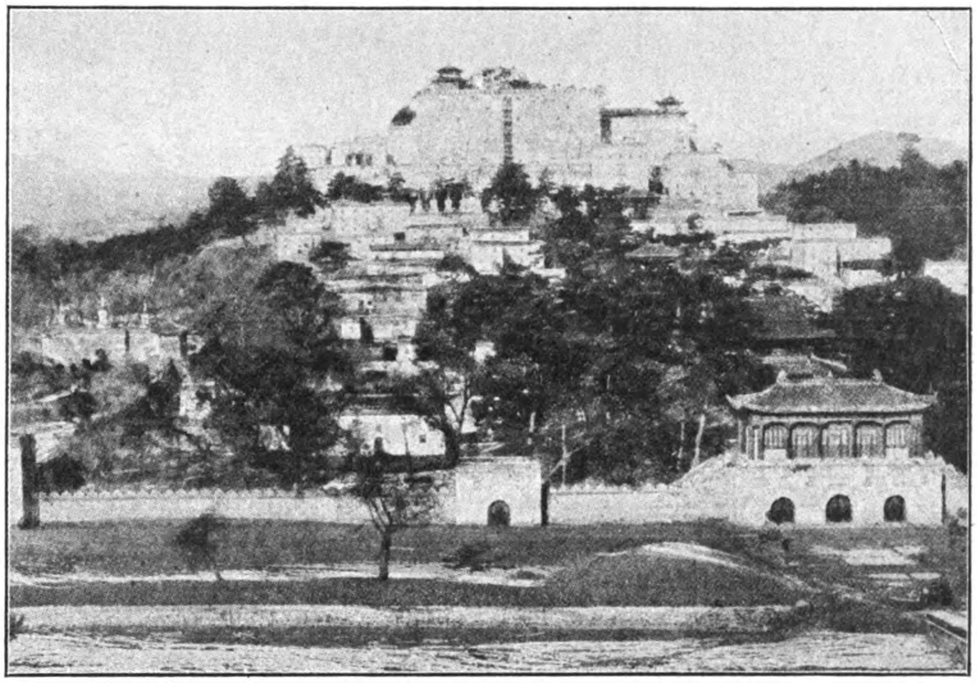
centre taps a large and rich region which already exports and imports large quantities of products, despite the difficulties of transportation.

The territory traversed by these projected lines is in the mountainous belt through which the sweeping plains for Chihli give way almost abruptly to the great Mongolian tableland. The ranges generally run in the direction of north-east and south-west, and between them are rich valleys which are devoted to agriculture. Some general idea of the country, as well as the chief towns that will be touched, is given in the following descriptions of the proposed routes:—

From Peking to Jehol and Chih-feng

About 140 miles north-eastwards of Peking lies Jehol, or Chengtehfu, the old country-seat of China's monarchs, the spot to which Lord Macartney, in September, 1793, travelled to see the Emperor on behalf of the King of Great Britain. The chronicler of that Embassy stated that "it was probably for the first time that an English post-chaise rolled upon the road to Tartary," for Lord Macartney brought out his own carriage and travelled in it most of the way to Jehol, though some of the passes were so steep that he had to transfer himself to a palanquin while coolies hauled the post-chaise over the steep and rough way. The post-chaise, with its high-swung body, its springs, and general appearance of fragility, was a tremendous source of interest to the natives, and while perhaps no other vehicle of the kind has traversed the same route in the 121 years that have since elapsed, the descendants of those who were amazed at the strange contrivance of the "outer barbarian" have in store for them a greater surprise when the locomotive and its train of cars rushes over country which has not been accustomed to vehicles speedier than the springless Peking cart, a mule litter, or a palanquin, and which has mostly been famed for the spectacular processions accompanying the Imperial Court.

The road to Tartary is, too, much the same as it was when Lord Macartney traversed it. The same highly cultivated plains and sprinkling of grave yards just outside of Peking, with similar willows, poplars, and mulberry trees marking the country, are to be seen, and twenty odd miles away the same foothills up which the Embassy toiled have still to be surmounted by the traveller, with steeper passes rising beyond and creating scenery "pleasing and romantic," but perhaps not so populated as they were then with "wild goats and wild horses which were seen scampering along the hills," though men can no doubt still be found "ascending precipices—or virtual precipices—to find spots fit for cultivation." And the same Great Wall which so impressed the Embassy still crawls over the crests of ranging hills, then known as the Tartarian mountains, "descending into the deepest valleys, crossing upon arches over rivers, doubled and trebled in many parts to take in important passes, and interspersed with towers or massy bastions at almost every hundred yards, as far as the sight could reach, presenting to the mind an undertaking of stupendous magnitude." The travellers then, as now, approach the wall "by a steep ascent until they come to what is called the southern gate—which is thrown across the road which it passes over the summit of a range of hills in most parts inaccessible." As the road advances to Tartary it becomes more rugged and runs parallel with the ranges. Near Jehol the Embassy was greatly interested in what attracts all travellers to Jehol, the extraordinary perpendicular formation of indurate clay which rises on a mountain top like an inverted pyramid some 200 feet in height, and which is "left as a monument to the height of the ancient surface of the globe in this particular part of it." The chronicler of the Embassy records that the ascent to Tartary is such that some parts of it have been ascertained to be 15,000 feet above the surface of the Yellow Sea. Amidst these high grounds, and a little beyond the inverted pyramid, the mountains recede more from each other and open the valley of Jehol, with its Imperial Palace and garden, its temples and monasteries, "some set on gentle elevations, some on the plain, and some on a high hill approachable only by rocky stairs of difficult ascent," the valley being watered by a stream gliding gently through it and wafting in its sands many particles of gold."



Potala Miao, Jehol

Jehol is not a commercial centre by any means. It lives on past glory, but is the centre of administration for what is now northern Chihli province. A garrison is stationed there and rail connection to this place alone would be for purely strategical purposes. The collection of houses which is glorified by the name of city is not surrounded by walls, but is built upon the gently sloping hills, and from the distant passes looks picturesque by virtue of the temples and the trees which cluster about. Climbing up the highest hillsides and surrounding the preserves is the wall of the Imperial Palace, six miles in extent, which was built by the Emperor Chien Lung, over 200 years ago. "Here," writes Mr. John Hedley, in his 'Tramps in Dark Mongolia,' "Chien Lung and some of his successors were wont to go hunting in the Imperial forests still further north, but, in 1861 when the French and British troops battered at the gates of Peking, Hsien-feng, the then unworthy occupant of the Dragon Throne, fled to these hills and there ended his miserable reign. Since which time no Emperor has set foot within the grounds, an uneasy superstition rankling in the minds because the Emperor died there." The valley in which the temples stand is surrounded on all sides by lofty trees. The temples, five in number, are the habitations of Lamas, but the most important is the Patola temple, a replica of the Patola of Lhassa. It has nine tiers of windows, and houses 700 lamas. Standing at either end are magnificent specimens of Buddhist dagobas, topped with golden crests.

The survey of the route from Peking to Jehol for railway purposes disclosed that a line could be built with suitable grades, but beyond Mi-yun-hsien, about 43 miles from Peking, a considerable amount of heavy rock cutting and tunneling would have to be done. The line would practically be an extension of the railway at present in operation to Tungchow, and from that place to Mi-yun-hsien the country is fairly easy, but two bridges would be necessary, one over the Yun Liang-ho, at Shun-yi-hsien, 300 feet long, and the other over the Peiho, 900 feet, about 2½ miles south of Niu-lan-shan. From Mi-yun-hsien to Shih-hsia the line crosses the Chao-ho on a 700 ft. bridge about four miles from Mi-yun-hsien, and leaving the Chao-ho takes a pass to the north via Mu-chia-yu with a grade of 1 in 100, and with a short section of somewhat heavy rock cutting. Another bridge of 300 feet over the Mang-niu-ho, and country giving a general grading of 1 in 400, takes the line to Shih-hsia, beyond which heavy cutting is again necessary. A tunnel 300 feet long leads to Hsin-kai-lung, and the line, developing to the east, crosses the Chao-ho again on a bridge 700 feet long, and turning north through an unavoidable tunnel of 600 feet enters directly at the front of the town of Ku-pei-kow, at the Great Wall. In passing Ku-pei-kow the space is very limited between the Wall and the river, and it will be necessary to utilise the space occupied by the Wall for a short distance. From this point a more northerly route than the main road is taken, easier grades being available (from 1 in 100 to 1 in 200) until La-ho-kow is reached. The line then sets due north with grades up to 1 in 70, to a tunnel 4,000 feet long through the Shih-pa-pau-ling, when a down grade is obtained of 1 in 100 to a valley, past Ping-fong-tzu, and up again by a 1 in 300 grade to the Pien-lung pass, whence another tunnel 2000 feet long on a 1 in 100 grade is necessary, leading to the village of Nau-tsan-tun. A wide valley through which flows a tributary of the Hsin-chao-ho is availed of to Tatun, easy grades then developing the valley of the Lan-ho the line skirting the foothills on a 1 in 70 gradient, with a short tunnel 500 feet long through a rocky spur at Wu-mu-liang. Several unavoidable bridges are necessary as the line tortuously traverses the Lan-ho valley, much benching and curves with a 2,000 feet radius being required. At Su-tao-ho the line finally crosses the Lan-ho, and, eventually passing through a tunnel, will cross the Yu-tze-ho and enter the Mong-niu-ho valley, skirting the foothills, on a grade of 1 in 70 to 1 in 80, finally emerging through a tunnel of 3,000 feet into the Jehol valley. The exact approach from Kwan-jen-ling to Jehol will require considerable time to locate, as the line will have to develop round the sides of the valley, to the west of Jehol, making the city through some of the poorer suburbs. The station yard will be on flat open ground to the south of the city and on the west bank of the river.

The line from Peking to Jehol crosses the watershed of the Pei-ho on the south, and the Lan-ho on the north, meaning a general rise in grade of over 1,600 feet, and can be built at a comparatively moderate cost considering the mountainous nature of the country.

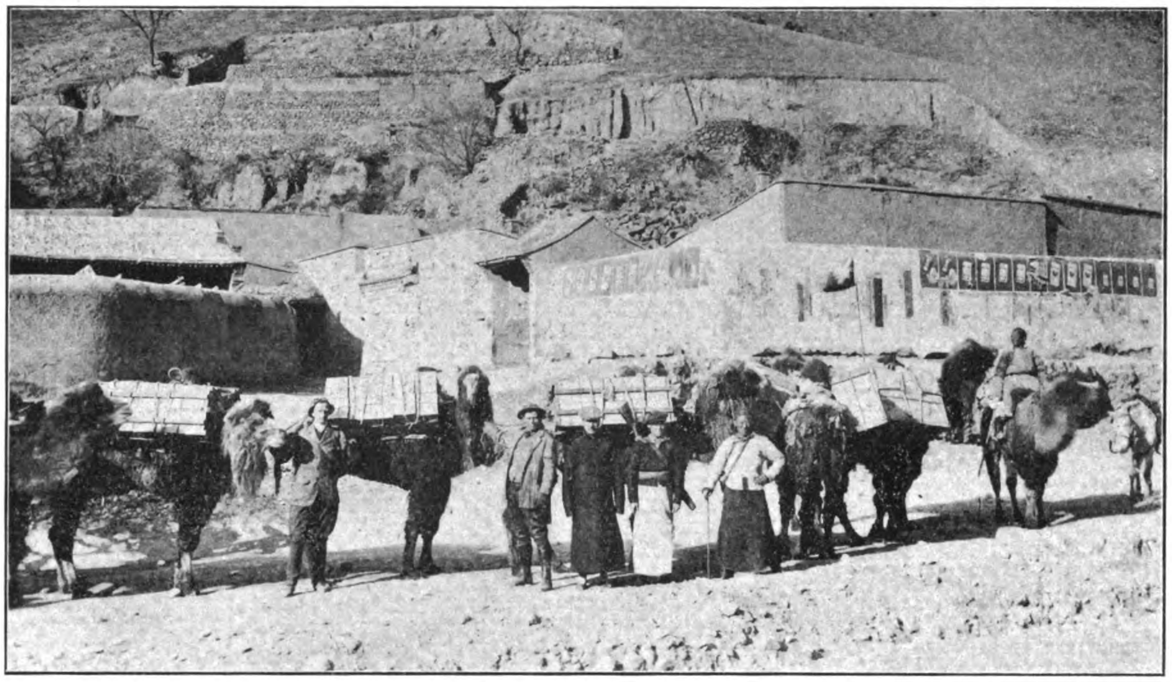
No survey has been made of the route to Chih-feng, but the line would probably follow the valley of the Je-ho rise over the Huang-hai range, between Mo-ke-men and Wang-yeh-tien. It would then drop down the valley of a tributary of the Lacha-ho for some distance, or follow the main road via Liang-pu-fu, and Ta-lo-tu to Chih-feng. The country is mountainous, but the intervening valleys permit of comparatively easy

gradients, and construction might be kept within a cost which would permit of trade being developed to pay cost of operation and interest on the capital outlay within a reasonable time.

From Kalgan to Dolonor.

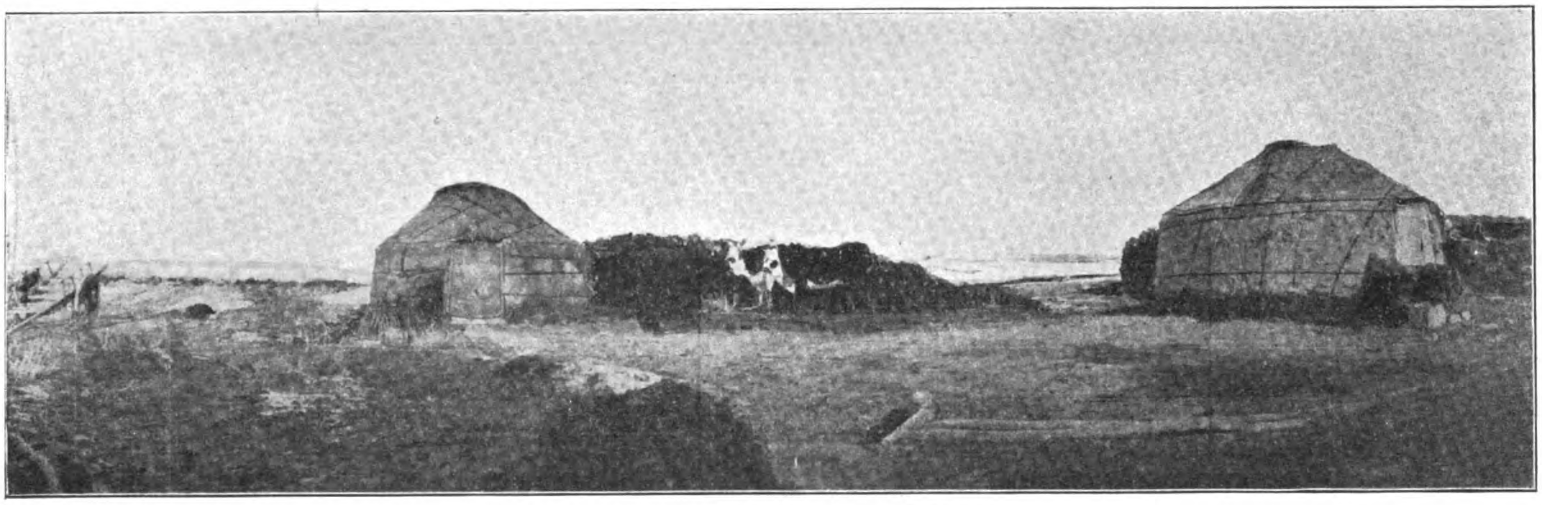
The Mongolian tableland rises almost abruptly from the plain upon which Kalgan stands, and practically the only difficulty in connecting Dolonor with the railway now operating between Peking and Kalgan, is the rugged range of mountains which lies behind Kalgan and which has in the centuries stood as the barrier against the free advance of Mongol hordes into China. Once that range is surmounted the route over the tableland offers no difficulties, being mostly open undulating country.

At present the road to and from Mongolia traverses what is known as the Kalgan pass, virtually the rocky, sandy bed of what is, in the rainy season, a mountain torrent, and all merchandise is carried either by camels, mules, pack ponies, or in carts. In the dry season Kalgan is a busy city and before the railway was extended towards Shansi it is estimated that altogether some 10,000 animals passed through each day bound in one direction or the other. Even at the present time the traffic from the surrounding country is very large, the Mongolian caravans bringing in soda crystals—to be converted into blocks at Kalgan for transportation to Peking and elsewhere,—salt, fur, camels' hair, wool, medicines, hides, etc. The soda crystals mostly arrive in small carts with wooden wheels, without tyres, capable of carrying some 650 lbs. and are brought from lakes sometimes more than 300 miles distant. The outward caravans and carts carry European articles, piece goods, tea, oil, cigarettes, candles, etc. At one time the whole of the tea trade of Russia went through Kalgan and over the Gobi on the backs of camels, thousands of these animals being



Part of a camel caravan loaded at Kalgan and ready to start across the Gobi Desert for Urga carrying goods for the British American Tobacco Company. The Europeans in charge are Messrs. Rusted (first on the left) and Schroeder (second on the left) of the British-American-Tobacco Company's establishment at Kalgan.

traders going to or coming from Kalgan, the passage being just broad enough to permit one cart to pass at a time, thus obviating any possible running of the Customs. Thence the road, rough, and difficult to travel on foot leads between rising mountains up a gradual ascent for ten miles, when it becomes precipitous and increasingly rough, to the level of the plateau, fifteen miles from Kalgan. The ascent is 2,600 feet. The township of Han-no-pa, or Pan-pa, is the starting off point for all caravans crossing the Gobi or making for Dolonor or other Inner Mongolian districts. Several roads lead to Dolonor, the shortest being through Shih-pa-tai, Pai-miao-tzetan, Erh-to-wa, Tan-chang-mu-tzn Hsiao-ho-tzu, Shang-tai-ho, Ta-len-ti, Ha-pa-chiao and Cha-peng. This is a track across an undulating prairie, after a mile of rough ascent from Han-no-pa, bearing N. N. E., past rounded hills and over soil which in the dry weather makes an easy road. Ten miles of travel brings the small village of Shih-pa-tai, a collection of about forty houses, into view. The country in the vicinity is cultivated, wheat and millet thriving, and for the next 33 miles to Erh-to-wa the road runs through well cultivated Chinese farms, small villages being passed and flocks of sheep and herds of ponies and cattle being seen. The wells are all good. For fifteen miles from Erh-to-wa the country is still undulating and cultivated, and then breaks into valleys from one to three miles across, separated by hills from 200 to 400 feet in height. All the valleys are cultivated. Thirty miles from Erh-to-wa is the village of Hsiao-ho-tzu, and ten miles further is Shang-tai-ho, the village of Ping-to-no being between, but off the road. In this village there is a Belgian mission, the mission people farming in the spring and summer, and hunting in the winter. The country is more level and is cultivated up to Shang-tai-ho, where there is a remount station maintained by the Chinese Govern-



A resting place on the trade route north of Kalgan.

employed. They are also used to transport a large quantity of Chinese merchandise for sale in Mongolia.

From Kalgan to Dolonor the distance is some 145 or 150 miles. The road leads through the gate in the city wall, proceeds between rising hills along the bed of what is a raging torrent when the heavy rains fall, and passes through the Great Wall, which runs down on either side of a well-defined cleft in the hills. Chinese Customs officials here collect taxes from all

ment, the horses being purchased in Mongolia and sent to this station to be kept till drafted out for use in the Chinese army. A number of Ili mares were introduced here for breeding purposes, but during the recent troubles the Hunghutzes managed to steal many of them.

A plain stretches from Shang-tai-ho for 23 miles to near Ha-pa-chiao' where small hills about 100 feet high cluster. The country is used solely for pasturage, grass being exceedingly good in season. Dolonor is some

30 miles distant, the road leading over a level plain, with hills four to five miles away, for about ten miles, when an easy up-grade leads through small hills and sandy country, small lakes occurring near Cha-peng, about ten miles from Dolonor, and continuing practically to Dolonor, where they become marshes. Ducks, geese, and other water fowl abound. A few miles from Dolonor heavy sand is entered, and the road winds among sand dunes to the south gate of the city.

Dolonor, or Lama-miao, as it is very often called, is situated virtually due north of Peking in latitude 42 deg 16 min. A small mud wall surrounds it, the shape of the city being oblong, about half a mile in width from east to west and two and a half long from north to south. The houses are of mud, and the population numbers about 30,000. This is the centre of a great horse trade, ponies being brought in from all over Mongolia for sale to buyers from China. Up to 50,000 are sold annually, and in addition large numbers of cattle and sheep are also disposed of. There are many shops, most of them being devoted to the sale of idols and other impedimenta of temples. Two miles from the town are situated two large well kept temples containing over 1,000 priests, the temples having been built in the time of the Emperor Kiang-hsi.

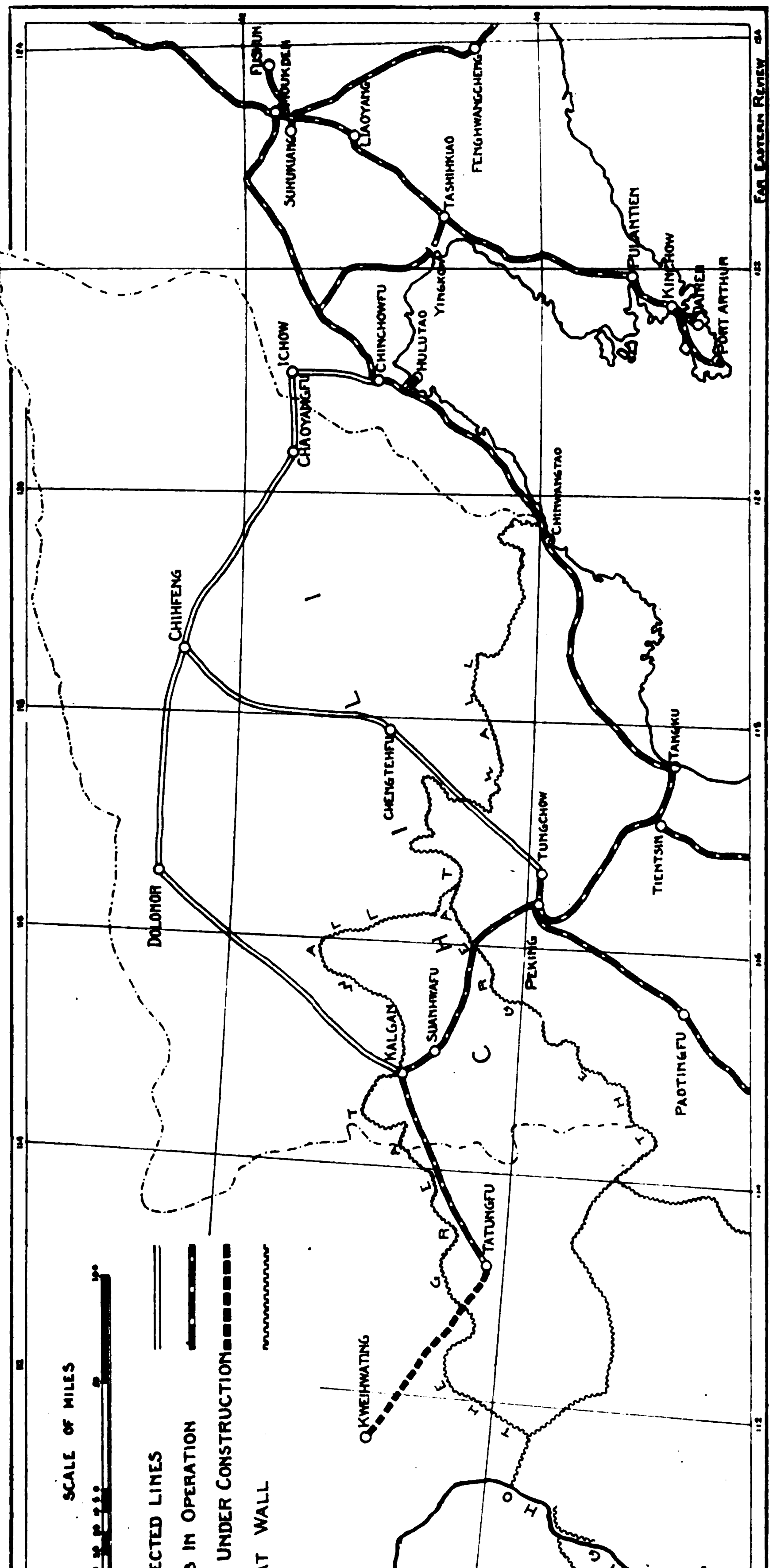
From Dolonor to Chih-feng

The road from Dolonor to Chih-feng runs mostly east-southeast, descends from the Mongolian plateau and crosses the old Imperial Hunting Park, passing through the new district city of Chui-tzu-shan and the towns of Pien-chiang, Pei-ting-tzu and the district city of Liang-pu-fu. There is, one route running from this city to Chih-feng, about 50 miles, almost direct to Chih-feng, another goes south-east through Wang-yeh-fu, and then to Chih-feng. The country is mountainous or hilly practically all the way, the road passing over the southern end and outlying hills of the Kingh-an range.

From Dolonor the road is sandy for about four miles, when the hills close in, and from the village of Chuan-wa-chao there is a rise of one in sixty for two miles, and a small hill 250 feet above the level of Dolonor is crossed, the ascent and descent being at about eight degrees. Descending to the south, a valley running east and west for about four miles is entered, the hills being about 300 to 500 feet in height. The country is grass lands, with very little cultivation, the Chinese farms which marked the western country being absent here. Four miles from this valley the Lwan-ho is crossed, the ford being about 70 yards across, and running two to three feet deep. Beyond, the country is sandy, dunes being continuous, but 25 miles from Dolonor more hills are ascended, and then follows undulating land with small short rises and descents. About are grassy plains but very little cultivation, with hills later on breaking the valley. Passing other valleys cultivated by Chinese the road rises for a mile and a half and then descends through a deep gorge 400 yards wide and two miles long, at a slope of one in ten, later rising at one in eight, and entering a narrow valley fringed with rugged hills. A few farms, with sheep, cattle and horses, break the monotony to the small village of Tung-tzu-kou, whence the road crosses the Ka-ta-ga river, and enters a narrow defile, eventually ascending through a valley for two and a half miles, the road rising at a four degree slope through timbered hills. A descent of three miles at four degrees brings into view a well cultivated valley where the small village of Kao-chia-tien nestles among Chinese farms.

For ten miles the road traverses this fertile stretch, grassy hills rising to 600 feet on either side, and for eight miles descends at about one degree crossing a small stream twice, and eventually paralleling running water for two miles until the intersection of four valleys is reached, where a Chinese village stands. The hills on each side of the valley are rugged, and continue so to the Tai-ku-ling pass, which is reached after a climb of 1,000 feet in a few miles, the slope being one of from ten to twelve degrees. The road then descends for eight miles to Tao-pa-tzu-men, passing through a close and intersected country with grassy hills, the basin of the valley

RAILWAYS TO CONTROL INNER MONGOLIA



Map Showing the Railways Lines to be Immediately Built, and those which are Projected with a view to Securing the hold of China upon Inner Mongolia. The Cities of Kweihwachang, Kalgan, Dolonor, Chihfeng, and Hulutao, shown on this Map are five of the Seven Recently Declared open to Foreign Trade with a view to Introducing new Foreign Elements into the Region to counteract Russian and Japanese Influence.

being 200 yards across and richly cultivated. Cultivated country continues for some distance the road traversing various valleys to Pei-ting-tzu where the road from Jehol is reached. Several distilleries are established in this vicinity and large houses with walled enclosures are built in the valleys. Indigo is largely produced, nearly every house having its cement vat for the reduction of the indigo by the admixture of lime. Grain is grown in large quantities, and supplies the distilleries, one of which, 15 miles from Pei-ting-tzu, consumes annually about 130,000 pounds of wheat, millet, and kao-liang in making samshui (Chinese wine).

The town of Liang-pufu is built on a broad plain, and is a district city of some 5,000 or 6,000 people. The road from this place to Chih-feng is about seventy miles. To the southeast is the home of Prince Kalachin, the most progressive of the Mongol princes. All his tribe wear queues and cultivate the land, having given up their nomadic existence. His territory is some 70 miles north and south by 140 miles east and west, and as far as is possible is cultivated. The Prince's Yamen is situated among hills, rising to 1,500 feet, and is a large, old-fashioned Chinese Palace, built in the time of Emperor Kiang-hsi. In the village two schools are maintained by the Prince, and in other ways he exhibits progressive tendencies. To Chih-feng the country alternates between mountain ranges and valleys, the road varying from easy to hard going, with some difficulties for railway construction.

The Motorist in North Chihli has often to make his road as he goes.

Chih-feng is situated, approximately, in latitude 40 degrees and 20 minutes north and longitnde 118 degrees and 35 minutes east from Greenwich. It is distant by road about 200 miles from Dolonor, 130 miles north-northeast from Jehol, and 180 west from Chinchow (on the Peking-Mukden railway), by way of Chaoyang. It is a comparatively new town having developed into an important trading centre from a small Mongol village. The name Chih-feng means "red hill," as also does the Mongol name of Wu-lan-ha-ta, by which it also goes, though "Hata" is mostly used for short. It is the largest trade mart in Inner Mongolia, and one of the largest (if not the largest) grain and beef markets in North China, while it is the second largest horse market. It is an unwalled town 2,300 feet above the sea level, three of its six streets being broad, and always full of life and bustle. The population numbers to 40,000 the business men being mostly Chinese. There are seventeen distilleries in the immediate neighborhood. Plenty of coal is to be had at cheap rates, three coal mines being in the vicinity. One is at Yuan-pao-shan, 25 miles to the east, and sells coal in Chih-feng at 45 cents Mexican for 130 pounds. Another mine 22 miles to the west sells hard coal at 30 cents for 130 pounds, while a third mine 30 miles to the south-east sells coal at 45 cents for 130 pounds. Grain is raised in the surrounding valleys, and one estimate of the trade put the annual sale of wheat and millet at 18,000,000 to 20,000,000 pounds weight each, kaoliang 48,000,000 pounds, and beans and corn in lesser quantities. Horses, cattle and sheep are also sold largely. Flax and flax seed oil are produced, while fruits such as peaches, apricots, grapes, melons, etc., are grown. There is a large trade in hides, and a good deal of leather is made. Foreign manufactures such as piece goods, oil, soap, canned goods, fancy articles, enamelled ware, matches, etc., are on sale in the shops, coming mostly by way of Chinchow. The average number of saddle ponies sold per year is from 15,000 to 20,000; mules 10,000 to 15,000. Transportation of all kinds is abundant. The shipping point is Chinchow, six days' haul through a more or less mountainous country. The horses and cattle placed on sale are nearly all brought in by the Mongols from the plains to the north and east, the mules being raised by the farmers in the vicinity.

Entering the Kalgan Pass. This view conveys a good idea of the character of the country.

Chih-feng is situated at the northern edge of a hilly or mountainous section of country. To the south there is a broken country of hill ranges with large fertile valleys. To the north the Mongolian plains extend for several hundreds of miles. Immediately to the south and west the country is level farming land; to the east and north there are hills from 200 to 400 feet high. Big cart roads lead to Jehol in the south, to Dolonor in the west, to Chinchow through Chaoyang in the south-east, to Pakou in the south-south-east, to Wu-tang-cheng in the north, to Mao-shan-tung and Chengping in the north-west.

Chinchow to Chaoyang and Chih-feng

Any railway built between Chinchow and Chaoyang will pay from the commencement, and it is almost safe to assume that traffic now passing between Chaoyang and Chih-feng, and vice versa, will be sufficient to make a railway cover its operating expenses and interest from the date of opening. Chinchow itself is the centre of a large trade which comes down from the cereal growing districts, and in consequence is a busy place. The main street is narrow and dark, but the shops are numerous and show signs of prosperity—a sign noticeable also in the residential quarters. The Chinese houses are well built, but made monotonous by the universal use of green paint, and the streets are filled with Peking passenger and other carts. From Chinchow to Chaoyang the route runs over the rolling plain to Ichow, 34 miles from Chinchow, and thus far no engineering difficulties are encountered. The section from Ichow is different. The line passes round a long bend of the Taling river, skirting obstructive rocky bluffs projecting into the river bed. Leaving the river it rises on a rather bad grade through a rock cutting to high land, later dropping over the Lui river and following one of its valleys on fairly easy grades to the watershed where there will be some grading of about 1 in 200, again rising to a deed cutting of about 2,000 feet in length through rock. Thence the line passes to the Lishukow valley, which requires careful surveying, as the valley itself has a grade of about 1 in 120 for some three miles, before it can be developed out to the Taling river. To cross the Taling river a bridge of about 12 spans of 100 feet each will have to be built at an approximate cost of $250,000. The bridge will have to be carried on pneumatic founds; perhaps rock bottom will be found at about 20 or 30 feet. After leaving the bridge the line will follow the north bank of the river, and though it will pass through five rocky heads will maintain an average easy grade following the general rise of the country to Chaoyang. The cuttings through the heads will be costly, but most are of soft sandstone. One neck will require a short tunnel of about 300 feet. The total distance from Chinchow to Chaoyang is about 83 miles and the line is estimated to cost about $4,225,000.

Chaoyang is a prosperous city situated among hills,—the highest of which lie to the south—and was at one time famous as the city of the three pagodas. At present only two stand, one having fallen long ago, the site now being occupied by a temple to the God of War. The city is not walled, contains many fine shops, and is a busy centre of trade. There are several lamaseries, altogether about 200 lamas being located in the vicinity.

No survey has yet been made from Chaoyang to Chih-feng. The trade road now follows the valleys, which will permit of fairly easy railroad building and passes several important mineral deposits. In fact the whole country round Chaoyang and on to Chih-feng is rich in minerals, and for hundreds of years the Chinese have been digging gold in the vicinity. It is the possibilities of development in this direction which make the future of any railway that may be built extremely bright.

LINKING UP KIANGSU AND HUNAN

AGREEMENT SIGNED FOR RAILWAY FROM NANKING TO CHANGSHA

On March 31 at Peking an agreement was signed between the Chinese Government and the British and Chinese Corporation for the construction of a railway linking up Kiangsu and Hunan. This line is to run from Nanking to Ningkwofu and Hweichow and thence through Nanchang to Pinghsiang. The line in operation from Pinghsiang to Chuchow will be taken over by the Corporation.

Branches will be built, from Ningkwofu to Wuhu and from Hweichow to Hangchow.

About 1,000 miles of construction is involved. The line is of great importance both politically and strategically, and in some quarters it is considered that the securing of the Agreement gives reality to the British claim to commercial predominance in the Yangtsze Valley. There is to be a British Engineer-in-Chief, Chief Accountant and Traffic Manager. The term of the loan is forty-five years and the security the line itself. The interest on the loan will be five per cent.

A flying survey of the line has already been made. The undertaking will necessitate the flotation of loans amounting to £8,000,000.

The British and Chinese Corporation is to take over the Shanghai-Hangchow-Ningpo Railway, and as a preliminary the Government has been endeavouring to arrange to buy the line from Kashing to Hangchow from the Chekiang Railway, Company. The line from Shanghai to Kashing has already passed under Government control. At the end of March some of the shareholders were protesting against the arrangement for transforming the Chekiang Railway into a State line and the matter has not yet been satisfactorily settled.

Mr. A. W. U. Pope, C. I. E., the General Manager of the Shanghai-Nanking Railway, has been appointed an adviser to the Board of Communications at Peking, and was to leave Shanghai for Peking early in April. He has been succeeded in the General Managership of the Shanghai-Nanking Railway, by Mr. A. C. Clear, M. I. C. E., Superintendent of Way and Works.

At the annual meeting of ratepayers of the British Concession, Hankow, a committee was appointed to consider a scheme for running an electric tramway through the Concession.

COMMERCIAL LOANS IN CHINA

A Peking paper reports that in view of the recent Hanyehping loan problem the Government has drawn up a set of new regulations governing the conditions for the merchants borrowing foreign loans. Recently the Government sent telegrams together with these regulations to the Civil Governors and diplomatic officers of the various provinces instructing them to publish them to the public and give due warnings to the merchants. These regulations are as follows:—

(1) Any merchant who borrows foreign loans to undertake business, no matter whether the loan is a new one or has been discussed in the past, should first make a report to the Ministry whose control his occupation is subjected to.

(2) When circumstances necessitate the merchant borrowing foreign loans he should first make a report to the Ministry stating its use and the sources from which he can derive money for its repayment.

(3) Merchants who have been allowed by the Ministry to borrow foreign loans should submit the agreement for such a loan to the Ministry for its approval. No agreement shall be considered as valid if it is signed before the Ministry approves it.

(4) Before the signing of an agreement the merchant should first inform the Ministry, which will send a delegate to witness the signing and no loan agreements shall be considered as valid unless they have been subjected to the above processes.

A Caravan preparing to start after a night's camp on the Kalgan-Urga route.

REFRIGERATOR CARS ON SIBERIAN RAILWAY

The Bourse Committee of Omsk has sent a petition to the Russian Department of Commerce and Industry, which in turn has handed it on to the Railway Bureau, regarding the construction of shore refrigerators for the preservation of valuable fish products at the towns of Nikolaevsk, Khabarovsk and Sryotensk, and also the equipment of refrigerator cars for the conveyance of fresh "keta" to the inland markets during the warm season. Although it is hoped to satisfy these requirements, when the entire Siberian lines are equipped with proper refrigerator buildings, in accordance with the general plan for the adaptation of the system to railway transport, nevertheless, the Railway Administration is anxious to meet the wishes of the petitioners and the needs of the fishing industry, through the provision of refrigerator cars from the railway itself, and to this end it has invited the chairman of the Siberian sub-district committee for the regulation of freight transport in bulk on the railways, at the town of Novo-Nikolaevsk, to explain the extent of the requirements of the fishing industry both as regards shore cold-storage warehouses and refrigerators cars. The chairman of the committee in his turn has applied to the Khabarovsk municipal administration for data with reference to the desirability of the erection at the place of a shore refrigerator, together with statistical information as to the annual export of fish products from Khabarovsk, the precise character of such goods and their distribution monthly, including the destination of the largest shipments. The Mayor of Khabarovsk has handed on this request to the Bourse Committee for reply.

JAPAN AND THE HANYEHPING LOAN

Last month it was announced in these columns that a storm of protest had been caused in certain quarters in China by the announcement that the Hanyehping Company had arranged a loan of $15,000,000 with Japanese financiers. The Chinese papers have since published what purported to be the text of the Agreements, and we give below a translation.

A thorough investigation into the circumstances surrounding the transaction has been made by the Society for the Investigation of the Industries of China. At a meeting of the Society at Peking on March 15 it was reported that the work of investigation was not yet completed, but a petition was read which it was proposed to forward to the President. This petition suggested that the Government should assume ownership of the Company. The Chairman, Mr. Ting, pointed out that there was an enormous deficit to be faced, and if the Government took over the enterprise it would have to bear responsibility for $50,000,000. Moreover its hands would be bound by seven agreements on very hard terms. It was decided that the petition should be revised before presentation to the President. This was done and the petition was presented to His Excellency towards the end of the month.

An interesting development has been the announcement that Sheng Hsuan-huai (Sheng Kung-pao) who is alleged to have arranged the loan with the Japanese financiers, had utilised the preliminary payment on account of the loan to redeem the scrip of his shares in the China Merchants' Steam Navigation Company. This scrip had been lodged in a British Bank, and it is alleged that Sheng Hsuan-huai is now negotiating for the disposal of his shares to Japanese interests. This report has caused something like consternation, as the China Merchants' Company owns property valued at $25,000,000 and has always been regarded as a national concern, although the Government has recently ceased to take an active part in the management. The outcome of the negotiations for Japanese participation in the ownership and management of the second great undertaking intimately associated with the Yangtsze will be watched with interest. Those opposed to the Japanese say that with the control of the Hanyehping Iron Works and the China Merchants' Steam Navigation Company Japan will gain a privileged position in the Yangtsze, which will ultimately make for the disadvantage not only of China, but of all other nations interested in the region. Experience has taught, however, that it is unwise to be dogmatic before facts are fully apprehended, and at present the situation continues to be too involved to render it desirable to form a decided opinion.

The Agreements as given in the Chinese Press follow:—

THE HANYEHPING LOAN AGREEMENTS

Agreement A.

Sometime ago on the 30th day of the 4th moon of the 3rd year of Hsuan Tung of the late Ching Dynasty, that is the 1st day of the 5th month of the 44th year of Meiji, the Hanyehping Coal and Iron Factories and Mines Company Limited, (hereinafter called the Company) of the Republic of China concluded an Agreement with the Japanese Iron Works (hereinafter called Iron Works) and the Yokohama Specie Bank (hereinafter called the Bank), for the advancement of Yen 12,000,000 as the price for the purchase of pigiron, to be issued for the extension of the factories and the engineering works. The above was signed by both parties concerned.

After this, on the 11th day of the 2nd month of the 1st year of the Republic of China, that is the 11th day of the 2nd month of the 45th year of Meiji, when the Chinese Government was in urgent need of funds, the Bank advanced to it Yen 3,000,000, and the rest of the proceeds of the above loan were not delivered. At present it has been proposed that at Tayeh, Hupeh, two new furnaces be constructed for the mines, and that extension and reform be introduced into the Iron Works at Hanyang, Hupeh, as well as the railway and electric supply factories of Tayeh, the coal depots, electric factories, etc., of Pinghsiang, Kiangsi, therefore the old proposal is hereby resumed, and the rest of the loan namely $9,000,000, is settled. The redemption of the loan shall be made by the pig iron and ore which the Company shall sell to the Iron Works. The loan which shall be used for capital shall be raised by the Bank, and the Iron Works and the Bank jointly agree to this agreement, the articles of which are stated herewith:

Art. 1. The amount of loan which shall be lent to the Company by the Bank, is Yen 9,000,000. only.

Art. 2. With regard to the amount of loan stipulated in art. 1. according to the estimate of the expenditure for the new plan of improvement and expansion, to meet the annual expenditure the loan should be paid on the 15th day of the 1st month and on the 15th day of the 7th month respectively. If there be changes in the estimates of the work, or if there be obstacles delaying the progress of the work, the date for the payment of the proceeds of loan shall also be delayed.

Art. 3. When the Bank hands over the proceeds of the loan to the Company in accordance with art. 2, the Company should give a receipt as an evidence of the proceeds of the loan stipulated in art. 1.

Art. 4. The redemption of the loan stipulated by this Agreement shall be made by paying in equal value in ore and pigiron as stipulated in Art. 7. The period for redemption shall be 40 years commencing from the date when this agreement is enforced. Commencing from the 7th to the 16th year. Yen 120,000 shall be repaid annually, commencing from the 17th to the 36th year. Yen 300,000 shall be repaid annually, and commencing from the 37th to the 40th year, Yen 400,000 shall be repaid annually. On the 15th day of the 6th month and the 15th day of the 12th month of the year respectively, the Company shall meet half of the above annual repayment.

In case the Company should be able to raise Chinese capital or real Chinese shares, which besides meeting the expenditure and the obligation of new and old debts, have still a surplus, or in case the profits of the Company have become so large that after deducting the interest, dividend, and setting aside reserve fund, there is still a surplus, the Bank shall agree to the proposal of the Company to redeem the full amount of principal and interest of this loan or any sum remaining unpaid at that time. However, 6 months' notice must be given to the Bank.

Art. 5. The interest of the loan stipulated by this Agreement shall be paid in the following manner, commencing from the date when the Agreement is signed to the 6th year, the rate of annual interest shall be 7%. But commencing from the 7th year to the date when the loan is redeemed, the lowest rate of the annual interest shall not be lower than 6%. The rate of interest shall then be fixed by the Company and the Bank according to the condition of the market. The interest shall be paid to the Bank, in two instalments on the 15th day of the 6th month and the 15th day of the 12th month of the year respectively. The payment of interest shall be reckoned from the date when the proceeds of the loan are actually paid over.

Art. 6. All the properties which the Company now owns as well as all the properties, movable or immovable, acquired with the proceeds, of this loan and the proceeds of the loan made on the 2nd day of the 12th month of the 2nd year of the Republic of China by the Bank to the Company, together with properties which shall be acquired or come into being in consequence of the above properties, shall all be mortgaged to the Bank as security for the loan stipulated by this Agreement and that loan made by the Bank to the Company on the 2nd day of the 12th month of the 2nd year of the Republic of China and Ta Cheng.

With regard to the properties which have been given as security by the Company to the Bank and other creditors besides those which are now given as security for the present loan and the loan of $6,000,000 made by the Bank to the Company on the 2nd day of the 12th month of the 2nd year of the Republic of China, they shall before the redemption of the said loans, be temporarily pledged to the Bank as 2nd security for the present loan and the loan of $6,000,000 advanced to the Company by the Bank on the 2nd day of the 12th month of the 2nd year of the Republic of China. When the loans besides the present one and the one of $6,000,000 advanced to the Company by the Bank on the 2nd day of the 12th month of the 2nd year of the Republic of China are redeemed, and the security for them is no longer needed, the properties shall, without undergoing any other process, become the common security of the present loan and the loan of $6,000,000 advanced to the Company by the Bank. The list of properties shall be attached with detailed plans, in drawing and clearly marked out which belong to the 1st and which the 2nd security. There shall also be clearly written, the names of creditors, the amounts of loans, and the date of freeing the security. The Company should keep all the title deeds of lands and the agreement with the Bank in the safe of the Accountant's Department of the Company, and there shall be two keys to the safe,—one shall be given to the Chief Accountant and the other to the Bank. Unless it is agreed by both parties, none of its contents should be taken out from the safe.

Art. 7. All the price paid by the Iron Works for the purchase of ore and pigiron (but this does not include the price for the products of the mines for the repayment of debts to two creditors named) shall be deposited in the name of the Company in the Bank, which shall first set apart a certain portion for the payment of the interest of the new and old loans, then the redemption of the portion of the loan for the year as stipulated in the Agreements, and then the amount of capital and interest which should be paid in the year: the Company can then at any time draw

from whatever funds are left. When the Iron Works should pay in to the Bank the above said price, it should forward the receipt of the Bank to the Company as an evidence that the amount has been paid for.

When the Bank receives the price abovementioned it shall consider the amount as a special account for the repayment of the interest and capital of the new and old loans by the Company to the Bank, it shall give to the Company a deposit book as a token of good-faith.

For the balance of the above account after paying the obligations untouched by the Company, the Bank shall pay interest to the Company according to the current rate.

Art. 8. If the price for the purchase of ore and pigiron paid to the Bank by the Iron Works be insufficient to cover the amount fixed by the Company for the payment of the interest and capital of the new and old loans due to the Bank, the Company should make good the deficit by paying ready money.

Art. 9. In case the Company should desire to contract loans or advances from banks or capitalists who are not Chinese, it should give preference to the Bank, and if the Bank fails to meet its need the Company will be free to raise means from other sources.

Art. 10. If the Bank should ask the Company to issue bonds for the purpose of clearing the debts the latter should comply with the request, but the former should first consult with the latter before doing so.

Art. 11. Commencing from the date when the Company has fulfilled all the obligations of this agreement, this agreement shallbecome void.

Art. 12. The payment of the proceeds and the repayment of capital and interest shall be made in Yokohama.

Art. 13. In case the parties concerned should disagree in the interpretation of the text of the Agreement or its annex, the decision shall be made by the common system of arbitration, and both parties may invite arbitrators to consider the matter.

Art. 14. Six copies of the Agreement together with its Annex should be written in Chinese and Japanese respectively; The Iron Works the Company and the Bank shall each hold two copies as evidence.

Republic of China, 2nd day, 12th month, 2nd year.

Ta Cheng, Japan, 2nd day, 12th month, 2nd year.

(Signed) Sheng Hsuan-huai, Chief of the Board of Directors of the Hanyehping Coal and Iron Works and Mining Company, Limited.

Chief Officer of the Iron Works.

Representative of the Yokohama Specie Bank."

Agreement B.

With the object of redeeming the Short Period Loans of heavy interest, most of which have been contracted from Japan, the Hanyehping Coal and Iron Factories and Mines Company Limited, of the Republic of China (hereinafter called the Company) agrees to redeem them by instalments spreading out for a number of years. The payment shall be made by means of the price of the ore and pigiron sold by the Company to the Japanese Iron Works (hereinafter called the Iron Works,) the loan necessary for the requirement to be raised by the Japanese Yokohama Specie Bank (hereinafter called the Bank.) The Iron Works and the Bank jointly agree to this agreement, the articles of which are stated herewith.

Art. 1. The amount of the loan which shall be lent to the Company by the Bank is Yen 6,000,000 only.

Art. 2. With regard to the amount of loan stipulated in art. 1., the Company has agreed with the Bank that all the debts which the former should repay by means of the present loan, should be submitted in a list to the Bank, which shall, according to the figures in the list, deliver over to the Company the amounts whenever due, so that the Company may transfer them to its creditors.

Art. 3. When the Bank according to the previous article remits the amount to the Company for the repayment of debts, the Company should give receipts to the Bank as a token of the delivery of the proceeds of art. 1.

Art. 4. The redemption of the loan stipulated by this Agreement shall be made by paying in equal value in ore and pigiron as stipulated in Art. 7. The period for redemption shall be 40 years commencing from the date when this agreement is enforced. Commencing from the 7th year to the 16th year, Yen 80,000 shall be repaid annually, commencing from the 17th to the 36th year, Yen 200,000 shall be repaid annually, and commencing from the 27th to the 40th year, Yen 300,000 shall be repaid annually. On the 15th day of the 6th month and the 15th day of the 12th month of the year respectively, the Company shall meet half of the annual repayment.

In case the Company should be able to raise Chinese capital or real Chinese shares, which besides meeting the expenditure and the obligation of new and old debts, leave still a surplus, or in case the profits of the Company have become so large that after deducting the interest, dividend, and setting aside reserve fund, there is a surplus, the Bank shall agree to the proposal of the Company to redeem the full amount of principal and interest of the loan or any sum remaining unpaid at that time. However, 6 months' notice must be given to the Bank.

From art. 5 to art. 14, there is no difference between this agreement and agreement "A," except the date and the amount of loans.

Supplementary Agreement

This Supplementary Agreement is made this day, in connection with the Agreement made on the 2nd day of 12th month of the 2nd year of the Republic of China, that is, the 2nd day of the 12th month of the year of Ta-cheng for a loan of Yen 9,000,000 (hereinafter called Agreement A) and the Agreement made on the 2nd day of the 12th month of the 2nd year of the Republic of China, that is the 2nd day of the 12th month of the 2nd year of Ta-cheng for a loan of Yen 6,000,000 (hereinafter called Agreement B) between the Hanyehping Coal and Iron Works and Mining Company Limited (hereinafter called the Company) on the one part and the Yokohama Specie Bank (hereinafter called the Bank) and the Japanese Iron Works (hereinafter called the Works) on the other part, the details of which are hereinafter stated;

Art. 1. Commencing from the date on which Agreement A and Agreement B and this Agreement come into force for a period of forty years, the Company shall sell to the Works, in addition to those amounts which have already been stipulated in other Agreements, the amounts of iron ore and pigiron mentioned as follows: 15,000,000 tons of first class iron ore (its quality should be the same as that produced by the Tayeh mine) and 8,000,000 tons of pigiron.

The Works shall notify the Company with regard to the delivery of goods, if iron ore, 2 years beforehand and, if pigiron, 3 years beforehand, and mutually decide upon the amount of goods to be delivered each year.

The Works shall consult with the Company and fix the price of iron according to the standard at which the Works pays for imported iron at the time when it notifies the Company.

The Company may, in accordance with art. 4 in Agreement A. and Agreement 13, repay the whole amount of the loan before the period stipulated in the Agreement, but in doing so it shall not affect the force of this article.

Art. 2. In case the annual output of iron ore by the Company exceeds 1,000,000 tons, the Company may consult the Bank to increase the yearly instalments for redemption of the loan.

Art. 3. The Company shall employ a Japanese engineer, called the Highest Engineering Adviser. The Company is willing to ask the Works to choose such an Adviser as mentioned above.

Art. 4. When the Company undertakes any work of improvement or repair or purchase of machinery, it should consult with the Highest Engineering Adviser mentioned in Art. 3. As to the ordinary daily work, the Adviser may express his opinions and give directions, from time to time.

Art. 5. The Company should employ a Japanese Audit Adviser.

The Company is willing to ask the Bank to choose such an Adviser as mentioned above.

Art. 6. With regard to the receipts and payments of the Company it shall consult with the Audit Adviser, before taking any steps.

Art. 7. Agreement A. Agreement B. and this Agreement shall not be enforced until the following conditions have been fulfilled:—

(a) The conclusion of the Agreement employing the Engineering Adviser.

(b) The conclusion of the Agreement for employing the Audit Adviser and drawing up of the regulations regarding his duty by the Company and the Works.

Art. 8. In case the parties concerned should disagree in the interpretation of the text of this Agreement or its annex, the decision should be made by the common system of arbitration, by which both parties may invite arbitrators to decide the matter.

Art. 9. This Agreement together with its annex shall be made out in six copies in both Chinese and Japanese, two copies of each shall be kept by the Works, the Bank and the Company as evidence.

Annex 1

The Chinese Hanyehping Coal and Iron Mining Company, Limited, on the 2nd of 12th month of the 2nd year of Tacheng concluded an Agreement with the Japanese Iron Works and the Yokohama Specie Bank, for a loan of 9,000,000 Yen and made on the same day another agreement for a loan of 6,000,000 yen. This annex is hereby stipulated in connection with the 2nd clause of art. 4 of these Agreements, and copies are now exchanged, as follow:—

In case the Chinese Government can lend the Company real Chinese capital raised internally, that is, the Chinese Government does not borrow it either directly or indirectly from other countries and, in case, the rate of interest is lower than that of this loan with no security whatever, the Bank shall agree to the proposal of the Company to redeem the full amount of this loan or any sum remaining unpaid at that time with the abovesaid low-interest capital.

This annex shall be made out in six copies each in both Chinese and Japanese, two copies of each shall be kept by the Works, the Bank and the Company as evidence.

The 2nd day of the 12th month of the 2nd year of Ta Cheng.

The 2nd day of the 12th month of the 2nd year of the Republic of China.

Annex 2

According to the second clause of Art. 1 of the Agreement made on the 2nd day of the 12th month of the 2nd year of Tacheng or the 2nd day of the 12th month of the 2nd year of the Republic of China, between the Hanyehping Coal and Iron Mining Company, Limited and Iron Works and the Yokohama Specie Bank on the other part it is provided that the selling price of the iron ore shall be regulated by the standard at which the works pays for imported iron at the time when the works notifies the

Company, etc. It is hereby again stated that the price shall be fixed by the mutual consent of both parties and the Works shall not force the Company to accept the price which the Works offers for the imported iron, so as to show fairness.

This annex shall be written six copies in both Chinese and Japanese two copies of each shall be kept by the Works, the Bank and the Company as proofs.

The 2nd day of the 12th month of the 2nd year of Ta Cheng.

The 2nd day of the 12th month of the 2nd year of the Republic of China.

Agreement with the Highest Engineering Adviser

This Agreement made this day, the 15th day of the 12th month of the 2nd year of the Republic of China between the Hanyehping Coal and Iron Works and Mining Company (hereinafter called the Company) on one part and (大島道太郎) (hereinafter called the Adviser) on the other part, the articles of which are stated hereinafter.

Art. 1. The Company undertakes to engage at Hanyang or Hankow the Adviser for five years commencing from the 11th day of the 1st month of the 3rd year of the Republic of China, that is the 11th day of the 1st month of the 3rd year of Ta-cheng of Japan to the 10th day of the 1st month of the 8th year of the Republic of China and Ta-cheng of Japan, to this the Adviser has also given his consent.

Art. 2. The Adviser shall acknowledge the power and duty of the Chairman of the Directors and the Chief Manager (or acting Manager) of the Company. The duties of the Adviser should be according to those stipulated in the agreement between the Company and the Japanese Iron Works, a copy of which is attached herewith and shall be recognised as a part of this agreement.

Art. 3. In case the Adviser fails to or is unwilling to perform the whole or part of his duty, the Company, with the consent of the Works, shall have the power to discharge him, after giving him notice three months previous to the date of his discharge.

Art. 4. The Adviser shall devote all his time and attention to the business of the Company, and, without the consent of the Company, the adviser shall not be allowed to undertake any business other than that of the Company, either directly or indirectly, for himself or for others, or to take up other occupations.

Art. 5. Without the consent of the Chairman of the Board of Directors the adviser shall not let any letters or other records of the Company in his keeping be made known to others. But he may give necessary hints to the Yokohama Specie Bank or the Iron Works for the protection of their interests.

Art. 6. As the position of the Adviser is important and his relationship to the Company is intimate, his attitude towards the company should be careful and attentive and he should be always kind and friendly to the Chinese with whom he deals.

Art. 7. The Company provides for the Adviser an unfurnished private residence suitable for his position; expenses for heating, lighting, medicine and medical attendance should be paid by the Company. Should it be necessary for him to remain in a hospital not belonging to the Company, the Company shall pay the medical bills for him.

Art. 8. From the 11th day of the 1st month of the third year of the Republic of China and Ta Cheng of Japan and as long as the agreement remains in force the Adviser shall receive Yen 20,000 a year from the Company as his salary, which shall be paid in equal monthly instalments.

If the Company is able to re-pay its loans contracted from the Yokohama Specie Bank and the Iron Works before the time mentioned in art. 1 and 10, the Adviser shall be entitled to receive the whole amount due to him according to the full term of service as stipulated in this agreement. When the adviser travels for the business of the Company, the Company shall pay him all the actual expenses besides 20 dollars a day for allowance from the date of his departure to the date of his return. When the Adviser comes to the Company to assume his duty or leaves the Company after the expiration of the agreement or is discharged during the period of the Agreement, the Company shall pay him travelling expenses and other fees as provided in the previous article.

Art. 9. The leave of absence which the Adviser is entitled to have is two months a year, if his absence does not exceed the limit, the remaining days may be saved for the year following.

Art. 10. If neither of the two parties inform the other to discontinue the Agreement 3 months before the date of its expiration, the agreement shall continue to be operative for a period of 5 years.

Art. 11. If there is any dispute between the two parties in connection with the Agreement, each may appoint an arbitrator to settle the dispute. If the opinion of these two arbitrators disagree with each other, the two parties may conjointly ask a third man in writing to pass judgment upon the matter, and his judgment shall be final.

Hereby the seals and signatures of the parties concerned are affixed on the 15th of the 2nd month of the 2nd Year of the Republic of China and Ta Cheng of Japan.

(Signatures)

Regulations Regarding the Duties of the Audit Adviser

According to Art. 5 of the Supplementary Agreement concluded on the the 2nd day of the 12th month of the 2nd year of the Republic of China and Ta Cheng of Japan between the Hanyehping Coal and Iron Factories and Mines Company, Limited (hereinafter called the Company), and the Japanese Iron Works and the Yokohama Specie Bank (hereinafter called the Bank), the Company has consented to engage a Japanese Audit Adviser. The following are the duties and responsibilities of the said Adviser, fixed by the Company and the Bank:

1. With regard to the financial affairs of the Company, the Audit Adviser shall be the adviser of the Chairman of the Board of Directors and the Chief Manager or Acting Manager of the Company. His advice shall be consulted, but he shall not enforce any thing at his own responsibility or issue direct orders.

2. With regard to the affairs in connection with the receipts and payments of the Company the Audit Adviser shall be consulted before they are carried into effect; but as to the funds in connection with the daily receipts and payments, no previous advice is needed. This article does not govern items which can be investigated by the Adviser afterwards.

3. Should the Audit Adviser think it absolutely necessary, he may submit his proposals regarding the best method for the solution of the financial affairs of the Company, but the Company shall have the right of making the final decision.

4. Should the Audit Adviser deem it necessary he may engage a Japanese Assistant, and the Company shall bear all the expenses. However with regard to the salary and the contract of the said Assistant they must first be approved by the Chairman of the Board of Directors, the Chief Manager or the Acting Manager.

5. Unless it be through the hands of the Chairman of the Board of Directors, or the Chief Manager, or the Acting Chief Manager, the Audit Adviser shall not have any official dealings with persons besides the members of the Company.

6. In case the Audit Adviser should leave his post on account of the expiration of contract or some other cause, all the books and documents of the Company which are under his control should be handed back to the Company as they shall be at that time.

7. In the performance of his duties, the Audit Adviser may at any time investigate the properties owned by the Company the despatches and documents, and the reports of the enterprises. He may also demand statistics to be made for the above, or may make inquiries.

8. With regard to the new loan, the redemption of loans, or changes made in the contract of loans, no matter whether they be great or small, the Company should first consult with the Audit Advister.

9. When the Company wants to accept any proposal which affects the properties the Audit Adviser should first be consulted.

10. The Company shall deliver over to the Audit Adviser the estimates made by the Highest Engineering Adviser with the Company regarding the repairs or construction of factories, railways, jetties and anything in connection with the mines.

11. The following are items which shall be consulted and decided between the Company and the Audit Adviser:

(1) The annual estimates of receipts and expenditure.

(2) The annual report of the profit and loss accounts; the properties and the debts; and all other reports concerning business.

(3) The disposal of either part or whole of the properties, and the increase or decrease of the capital.

12. The Company shall hand over to the Audit Adviser the monthly estimate of the expenditure of the factories and mines, fixed by the Company and the Highest Engineering Adviser as reports.

13. The Company shall report to the Audit Adviser the changes and the increase or decrease of salary of the engineers, assistant engineers or other employes.

14. With regard to the fixing of regulations governing the employees who handle money in the offices, factories, railways and mines, the Audit Adviser shall first be consulted.

With reference to the above articles, and art. 5 of the Supplementary Agreement the salary for the Adviser engaged by the Company shall not exceed Yen 15,000 annually, which shall be paid in monthly instalments by the Company, the responsible persons of both parties concerned shall sign and affix their seals as a token of good faith.

There shall be six copies of these regulations made out both in Japanese and Chinese, two copies of each shall be kept by the Iron Works, the Company and Bank for witness.

Republic of China, 15th day, 12th month, 2nd year.

Ta Cheng, Japan, 15th day, 12th month, 2nd year.

(Signatures)

Regulations Regarding the Duties of the Highest Engineering Adviser

With reference to Art. 3 of the Supplementary Agreement concluded on the 2nd day of the 12th month of the 2nd year of the Republic of China and Ta Cheng of Japan, between Hanyehping Coal and Iron Factories and Mines Company, Limited (hereinafter called the Company) and the Japanese Iron Works (hereinafter called the Works) and the Yokohama Specie Bank (hereinafter called the Bank), the Company has consented to engage a Highest Engineering Adviser. The following are the duties and responsibilities of the said Adviser, fixed by the Company and the Bank:

1. With regard to technical matters, the Highest Engineering Adviser shall be the adviser of the Chairman of the Board of Directors, the Chief

Manager, (or Acting Chief Manager) of the Company. His advice shall be sought, but he shall not enforce anything on his own responsibility or issue direct orders.

2. With regard to the plans for improvements and repairs in connection with the working of the Company, and the purchase of machinery, etc., the Highest Engineering Adviser shall first be consulted before they are carried into effect; but with regard to the daily affairs in connection with the works the said Engineering Adviser may at any time submit his opinions and plans for them.

3. Should the Highest Engineering Adviser think it absolutely necessary, he may submit his proposals regarding the best method for the improvement of the technical works, but the Company shall have the final right of making decision.

4. Should the Highest Engineering Adviser deem it necessary he may engage a Japanese Assistant, and the Company shall bear all the expenses.

However with regard to the salary and the contract of the said Assistant, they must be approved by the Chairman of the Board of Directors and the Chief Manager (or Acting Chief Manager.)

5. Unless it be through the hands of the Chairman of the Board of Directors or the Chief Manager (or the Acting Chief Manager), the Highest Engineering Adviser shall not have any official dealings with the persons besides the members of the Company.

6. In case the Highest Engineering Adviser should leave his post on account of the expiration of the contract or some other reason, the drawings, maps and documents of the Company which are under his control shall be all delivered back to the Company in such condition as they shall be at that time.

7. In the performance of his duties the Highest Engineering Adviser may at any time institute an investigation regarding the progress of the engineering works of the Company, and the condition of other enterprises. He may also demand that necessary statistics be made, or may make inquiries.

8. With regard to the plan of works for the year, the Company should first consult with the Highest Engineering Adviser before making any decision.

9. The Company shall report to the Highest Engineering Adviser the changes and the increase of salaries of the engineers, and assistant engineers.

In witness of the above articles and Art. 3 of the Supplementary Agreement, which provides that the salary of the Highest Engineering Adviser should not exceed the amount of Yen 20,000 annually, which shall be paid by the Company in monthly instalments, etc., both parties concerned hereby set their signature and seals as a token of good faith.

There shall be made six copies of the present regulations both in Japanese and Chinese, and the Iron Works, the Company and the Bank shall each keep two copies as a proof.

Ta Cheng, Japan, 15th day of the 12th month 2nd year.

Republic of China, 15th day of the 12th month of the 2nd year.

(Signatures.)

CHINA'S NEW MINING REGULATIONS

The new Mining Regulations were promulgated on March 11. By Article IX of the Mackay Treaty of 1902 China agreed that the Mining Regulations should be framed so as to offer no impediment to the attraction of foreign capital, or place foreign capitalists at a greater disadvantage than they would be under generally accepted foreign regulations. A translation of the Regulations follows :—

Chapter I. General Rules.

Art. 1. Mining enterprise includes prospecting, actual mining and other business connected with them.

Art. 2. Mining rights are rights to prospect and operate mines.

Art. 3. Subjects of the Republic of China or persons who have become subjects of the Republic of China by proper process of law may secure mining rights.

Art. 4. Subjects of treaty nations may secure mining rights when doing joint business with subjects of the Republic of China. But in such cases they must be subject to these regulations as well as other laws connected with them.

Foreigners will not be allowed to hold more than half of the total number of shares of the mining concern.

With regard to the foreign subjects mentioned first in this article (unnaturalized foreign subjects) they shall be required to present to the Minister of Agriculture and Commerce or the Director of the Mining Supervision Office a certificate issued by their own diplomatic officer or consul proving that they are willing to be subject to these regulations and other laws connected with them.

Art. 5. When two or more persons join in a mining business or petition to start a mining business, they should choose one as representative, and notify the Director of the Mining Supervision Office of their respective district; in case they fail to do this the Director shall appoint one of them according to his own decision, to act in that capacity.

The persons who join in a mining business or petition to start a mining business as stated above shall be considered as persons who have entered into partnership under contract or agreement.

Art. 6. The following are minerals in their respective classes :

Class 1: gold, silver, copper, iron, tin, lead, antimony, nickel, cobalt, manganese, zinc, aluminium, arsenic, mercury, molybdenum, bismuth, platinum, iridium, barium, chromium, uranium, various kinds of coal, diamonds and various kinds of precious stones.

Class 2: rock crystal, asbestos, mica, corundum, emery, apatiti, nitrates, pyrite, borax, flourspar, feldspar, peat, bitumen, pitch, meerschum, Kaolin diatom, tropolite, magnesium earth, fuller's earth, stones used for pigments such as ochre red earth, etc., gypsum, sulphur, pumice stone, marble, (for ornamental purposes) talc, graphite, amber.

Class 3: slate, porphry, earthy lime, limestones, sandstones, granites, marbles, white marble, dolomite, marl, clay, fireclay, and other kinds of stone quarried for building or other useful purposes.

Salt and kerosene oil shall be exploited only by the Government, and therefore will not be included in the above three classes.

Art. 7. For minerals not specified in the above tables the Minister of Agriculture and Commerce may classify them according to his judgment from time to time.

Art. 8. With regard to the minerals specified in Article 6 (including waste mines and extracted ores), unless permission has been obtained from the Government none shall be allowed to make investigation or start operation. But this does not include the various mineral resources which are owned by the public.

Art. 9. With regard to the minerals specified in Article 6, Class 1, the party which petitioned first for the mining right shall be given the first privilege to secure the Mining Rights regardless whether he be owner or non-owner of the surface land property.

Art. 10. With regard to the minerals specified in Article 6, Class 2 the owner of the surface land property shall have the first right to secure the Mining Rights. But in cases where the owner declares that he does not wish to secure the Mining Rights or when the party having registered fails to work the mine within one year, the Minister of Agriculture and Commerce or the Director of the Mining Supervision Office may sanction others in securing such Mining Rights.

Art. 11. With regard to the minerals specified in Article 6, class 3 they shall be exploited by the owner of the surface land property or leased by him to others to exploit, but in each case it shall be reported to the local superior administrative official, to secure his approval.

The local superior administrative officials, when approving such requests, should notify the Director of the Mining Supervision Office.

Chapter II. Mining Areas

Art. 12. Mining Area is an area of land within which the possessor of Mining Rights has secured the sanction of the Government to prospect or to operate the mines.

Art. 13. Land coming under the following heads shall not be given as mining areas:

1. Land within one li from the boundaries of the building or tombs of ancient sages and Emperors or Kings.
2. Land in close connection with fortifications, military strategic points, naval bases and areas of importanee to the offices and factories of war supplies, without permission from the governing officials.
3. Areas within one li from the territories of commercial ports or trading markets, without permission from the governing officials.
4. Areas within four hundred feet from the sites of official or public buildings, parks, famous ancient monuments, public roads, railways or water supplies and water ways, without permission from the governing official, owner or people who are responsible for such properties.

Art. 14. Mining areas shall be marked with straight lines. The space under ground within the area of the mining right shall be bounded by vertical planes dropped from the surface boundary lines.

Art. 15. The surface area of the mining areas shall be reckoned by square li or mow. 60 square chang make one mow, and 540 mow make one square li. (one chang is 10 Chinese feet.)

Art. 16. A coal mine area shall have a surface between 270 mow and 10 square li. Other mines between 50 mow and 5 square li.

With regard to the above rules the Minister of Agriculture and Commerce may increase or decrease when he deems it necessary under special conditions.

Art. 17. Not more than two different Mining Rights shall be established within one mining area except when the rights are for minerals of different natures or under circumstances stated in Article 35.

Art. 18. Permission should be secured from the Director of the Mining Supervision Office when tunnels are opened outside the mining area for the purpose of draining, ventilation or transportation. The tunnel site shall not be considered as a mining area.

When in the course of making a tunnel mineral ore is discovered, the Director of the Mining Supervision Office should be notified at once.

Upon receiving the above information the Director of the Mining Supervision Office, if he is satisfied that such minerals are worth exploiting, may set a time limit and compel the owner of the tunnel to take it into his mining area.

Chapter III. Mining Rights.

Art. 19. Mining Rights shall be considered as rights of possession, and are subject to the laws governing unmoveable properties; but when one possesses rights of possession other than Mining Rights in the same mining area, the rights of possession of other properties shall still exist.

Art. 20. Mining Rights should not be surrendered to others in part.

Art. 21. With the exception of the case of handing down as legacy, transfer, fines for delaying to pay proper tax, or the seizure by the authorities, Mining Rights should not be made use of as an object of privileges. However, the right to operate a mine may be pledged as security.

Art. 22. With regard to the following cases petitions should be sent to the office of the Director of Mining Supervision for registration but when the Mining Right is under restriction (of obligation) no registration for business failure will be allowed:

1. The establishment, change, transfer, cancellation or restriction of the Mining Rights.

2. The establishment, change, transfer, cancellation or restriction of the pledge when the Mining Rights are pledged as security.

3. Withdrawal of partnership from the mining business.

Art. 23. Rules relating to the registration provided in the previous article shall be fixed separately by order of law.

Art. 24. With regard to the registration mentioned in Article 22, no case shall be considered valid until it has been registered; but this will not include cases pertaining to legacy of Mining Rights, expiration of Mining Rights and sale by auction as provided in these regulations.

Art. 25. Those who wish to prospect for mines shall first secure the sanction of the Director of the Mining Supervision Office by presenting him with a request together with drawings and explanations. The Director may, when he deems it necessary, instruct the local officials or send special deputies to investigate into the case or make personal inspections.

Art. 26. The time limit for prospecting shall be limited to two years.

Art. 27. Minerals secured when prospecting shall not be sold or used until the Director of the Mining Supervision Office has approved of it and taxes have been paid in accordance with these regulations.

Art. 28. Those who wish to operate a mine shall first submit a petition together with drawings and explanations to the Minister of Agriculture and Commerce through the Director of the Mining Supervision Office for approval and then register in the office. The Minister of Agriculture and Commerce may, when he deems it necessary, order the Director or send special deputies to investigate into the case or to make personal inspections.

In accordance with the previous article the Director of the Mining Supervision Office may instruct the local officials to investigate or make personal inspections.

Art. 29. The man who petitions to undertake the mining business may alter his name, etc. But at the time of investigation and at the time of operation, unless he petitions the Director of the Mining Supervision Office and the Minister of Agriculture and Commerce respectively, it will have no effect.

Art. 30. The petitioner for the operation of a mine should prove that the area for which he applies does contain the mineral he wants to operate.

Art. 31. If the petitioner does not submit a sufficiently complete plan and description, the Director of the Mining Supervision Office or the Minister of Agriculture and Commerce may set a date demanding correction, or the submission of another petition. Should there be no correction or new petition forthcoming within the fixed period, the petition will be rejected.

Art. 32. If the Minister of Agriculture and Commerce or Director of the Mining Supervision Office should consider the place which has been petitioned for investigation suitable for mining operations, he may set a date asking the petitioner to petition for the right of operation and if after the lapse of the period no such petition be submitted the petition of others may be considered.

Should the Minister of Agriculture and Commerce consider that the place for which a petition has been received asking for the right of operation, needs further investigation, the above provision should be followed.

Art. 33. Should the situation and condition of the area petitioned for operation be not in accordance with the real situation and condition of the bed of the mine, thus injuring the interests of the mine, the Minister of Agriculture and Commerce may set a period demanding that a petition be sent for correction. It after the lapse of the fixed period no petition is received for its correction the petition will be rejected. However the petitioner may also ask for correction without being instructed to do so.

Art. 34. Should the Minister of Agriculture and Commerce and the Director of the Mining Supervision Office consider that the area applied for for mining enterprises would injure the public interest or not be worth while for such enterprises, no permission will be given.

Art. 35. If on account of the situation and condition of the bed of the mine it be necessary to dig through an adjacent mining area, a consultation should be made with the neighbour, to obtain a certificate allowing such acts and a petition should be sent to the Minister of Agriculture and Commerce through the Director of the Mining Supervision Office to alter the mining area.

If it be not for the above reasons that it be desired to dig through to the adjacent mining area, besides obtaining written permission from the neighbouring proprietor of the mining enterprise, the permission of the mortgagee, if there be any, should also be obtained, and submitted by a petition.

Art. 36. If the area or portion of the area applied for for investigation be the same area which has already been obtained by others, the petition for that area should be rejected, if the mineral be also similar.

Art. 37. If the area applied for for operation be the same area which has already been obtained by others, a petition for that area should be rejected, if the mineral be also similar. But this does not apply to the case as stated in art. 35.

Art. 38. If the area or portion of area applied for for operation be the same area which has already been obtained by others for investigation, art. 32. clause 1, shall apply if the mineral of the mine be similar.

Art. 39. If the area applied for for mining enterprise be the same area which has been obtained by others the Director of the Mining Supervision Office shall give information to the latter if the mineral stated in the application be not similar to that of the latter, but this does not include the case when injury would be done to the mining enterprise of others.

Within sixty days of the above information the proprietor of the mining enterprise may have preference to the right of the new mining enterprise.

The above two clauses shall not apply to the case as started in art. 35.

Art. 40. If the area or portion of area applied for for investigation, or for operation be the same as that which has been applied for for investigation or operation by others, the one who sent in his petition first shall obtain the right. In case both persons send in their petitions at the same time, the Director of the Mining Supervision Office shall set a period instructing the petitioners to hold a consultation between themselves and then submit their petitions again.

If no petition be forthcoming within the set period, the right should be settled by casting lots.

The above provision made in the 1st clause shall not apply to cases specified in arts. 33, and 35 and case specified with "but—" in art. 39.

If the area applied for for investigation be the same as that which has been applied for for operation, and the mineral be similar the latter application shall have the preference if the petitions be sent at the same time.

Art. 41. Within thirty days after the expiration of the period for investigation the person who has the right of investigation shall have preference over others, with regard to an application for mining similar mineral.

With regard to the application for the right to mining enterprise in the above area by others if the minerals applied for by others be not similar, art 39 shall apply. In this case the one who applies first shall obtain the right.

Art. 42. Should the man who applied for the right of investigation, now apply for operation of the same mine, and should there be similar applications from others, the date when he forwarded the application for investigation shall be considered as the date he sent in his application for operation. But this does not include the case provided for in art. 40, clause 4.

The above shall also apply to the case when the applicant for the operation of a mine shall change his application to that of investigation.

The provision contained in the two above clauses shall not apply to the case when the period fixed has lapsed as stated in art. 32 and art. 33, clause 1.

Art. 43. In case of an increase or decrease, the amalgamation or division or any other alteration in the area of investigation a petition shall be addressed to the Director of the Mining Supervision Office for sanction and registration. If the changes be made in the area of operation a petition should be forwarded to the Minister of Agriculture and Commerce through the Director of the Mining Supervision Office for approval following which registration in the Office should take place before it can have legal effect.

Art. 44. The operator of the mining enterprise should from time to time submit the working plans with drawing and explations, to the Director of the Mining Supervision Office, for decision.

The possessor of the Mining Right shall operate the mines according to the plan and description passed by the Director of the Mining Supervision Office.

With regard to the plan and description of the above no change should be made without the approval of the Director of the Mining Supervision Office.

Art. 45. The proprietor of the Mining Right shall provide a detailed map and drawing of the underground works of the interior of the mine and a working record book which shall be kept in the office of the mining enterprise. A duplicate copy of each shall be submitted to the Mining Supervision Office.

The forms for the above drawing and book shall be fixed by the order of the Ministry of Agriculture and Commerce.

Art. 46. For any of the following causes a Mining Right of the proprietorship shall be cancelled:

(1) If after being registered for one year, no operations have begun without any reasonable cause, or in the course of operations a suspension has been made for one year or more.

(2) If the mining enterprise injures the public interest.

(3) If no compliance has been made with the order of the police, who according to the mining police regulations have instructed that some

precautions should be made to avoid disasters or that a temporary suspension should be made.

(4) When the passed plans and descriptions are not followed.

(5) When no mining tax is paid when due.

(6) When sanction has been given for operations by mistake.

Art. 47. The following rules should be observed when the proprietor of the mining enterprise pledges his right as security for loans:

(1) When the Mining Right is pledged as security for a loan, it will have no legal effect if a petition has not been sent to the Minister of Agriculture and Commerce for approval.

(2) After the right is pledged as security should the proprietor wish to divide, amalgamate, decrease, or increase the area of the mine, the approval of the lender or lenders should be obtained.

(3) When the Mining Right by official authority or on the proprietor's own accord is cancelled the Director of the Mining Supervision Office after the registration shall inform the lenders to whom the right is pledged. Within 30 days after the receipt of the information the lenders may petition the Director of the Mining Supervision Office requesting an auction of the mining enterprise. But this does not apply to the case when the Mining Right has been cancelled in accordance with the provisions made in the 2nd and 6th clauses of article 46.

(4) Within the time when it is on sale or during the process of auction, the right which has been withdrawn may still be considered as existing.

(5) After deducting the fees to the auctioneers and repayment of debts the balance of the sale shall be handed to the proprietor of the mining enterprise.

(6) The buyer of the Mining Right should have legal standing according to the provisions made in art. 3 and art. 4. He shall be considered as having obtained the Mining Right from the time when the original Mining Right was registered for cancellation.

Art. 48. If the proprietor of a mining enterprise disposes of the enterprise when his Mining Right has been cancelled the provisions in 4th, 5th and 6th clauses of the previous article should be followed.

Art. 49. When a petition is received applying for investigation or operation, if it be necessary that officials should be appointed to proceed to the place for investigation, the expenses of the officials thus sent shall be defrayed by the petitioner.

Art. 50. In case the neighbouring proprietor of a mining enterprise or other person concerned should find that there is something which needs investigation, he may petition the Director of the Mining Supervision Office requesting that officials be appointed to make investigation. But he must bear all necessary expenses.

Chapter IV. Land used for Mining Purposes.

Art. 51. The words "person concerned" used in this Regulation refers to the person who has right to the land used for mining purposes.

Art. 52. The "indemnity money" referred to in this Regulation refers to the price and rent of the land, and also refers to the compensation for the ordinary and actual losses incurred by the landlord and the person concerned.

Art. 53. In case there is necessity for the petitioner for the Mining Right or the proprietor of the Mining Right, to make a survey or investigation in other men's property, he may do so with the approval of the Director of the Mining Supervision Office.

After the above approval is obtained, previous notice should be given to the landlord or the person who has the surface right to the land, before such operation are carried out.

Art. 54. In a case where it is necessary to remove obstacles from the place so that a proper survey or investigation may be made, it must be done with the approval of the Director of the Mining Supervision Office.

After the above approval is obtained, previous notice should be given to the landlord or the person who has surface right to the land, before the work of removal can be started.

Art. 55. In order to prevent impending danger the proprietor of the Mining Right may enter the territory of others, or make use of it, but at the same time he must petition to the Director of the Mining Supervision Office and information should immediately be conveyed to the landlord or the person who has right to the land.

Art. 56. Should any loss be incurred to the landlord or person concerned on account of the events stated in the three previous articles, the proprietor of the mining enterprise should pay proper indemnity money.

Art. 57. For the following causes the proprietor of the mine may use the land of others:

(1) Opening shafts and digging tunnels.

(2) To put extracted ores, earth and stones, the rubbish after blasting operations, materials, etc., etc.

(3) The erection of mills for the dressing of ores, or smelters for the smelting of ores.

(4) The construction of large and small railways, roads and canals for transportation, water or gas pipes, drainage, pools, or wells, aerial tramways and telegraph lines.

(5) Construction of works and other labours necessary for mining enterprises.

Art. 58. When the land of others is utilized by the proprietor of mining enterprises according to the provisions of the above, the approval of the Director of the Mining Supervision Office shall first be obtained. At the same time a petition should be submitted with the plan and description, to the Director of the Mining Supervision Office for approval.

When the Director of the Mining Supervision Office gives the above approval, he shall notify or inform the landlord or the person concerned.

After the above information is given should the proprietor of the mining enterprise desire to obtain the right to the land he should consult with the landlord or the person concerned.

With regard to the provisions of the above two clauses, should the land belong to the officials the sanction of the officials of the said district should be obtained.

Art. 59. When the land is utilized the landlord or the person concerned should be compensated adequately.

Art. 60. If the land be used for more than three years, or if the land after being used has changed its condition so as to be unfit for any other use, the proprietor should consult with the landlord, or at the request of the landlord the price of the land may be given once according to the market rate. But after the enterprise is suspended or the use of the land is over, the land should be handed back to its original owner.

Art. 61. In a case where the use of a certain portion of land has decreased the value of the rest of the land, or has involved other kinds of losses, the landlord and the person concerned should be adequately compensated.

With regard to the rest of the land, which has lost its former utility, the provision of the previous article shall be followed.

Art. 62. Should it become necessary to erect or to alter the roads, drainage, walls, fences and so forth on account of utilizing the land of others, adequate compensation should be given. But this does not include the matter which has been settled according to art. 60

Art. 63. After the notice or information of the 58th article is given should the landlord, or person concerned, desire to alter the form of his property, put up new structure, altering the old structure, or to make wholesale repairs, etc., the approval of the Director of the Mining Supervision Office should be obtained, failing which no such compensation should be demanded.

Art. 64. After the notice or information of the 58th article is given should the mining enterprise be abandoned or changed, thus causing loss to the land, the proprietor of the mining enterprise should give adequate compensation to the landlord or person concerned for the losses incurred.

Art. 65. The landlord or the person concerned may demand adequate security from the proprietor of the mining enterprise for compensation.

Art. 66. If the use of the land has been mutually arranged by the landlord or person concerned and the proprietor of the mining enterprise, or has been fixed by the officials, or by a committee, while the arrangement for compensation or security has not yet been fixed, the proprietor of the mining enterprise may deposit an amount for compensation or find a guarantor, so that he may make use of the land at once.

Art. 67. The landlord or the person concerned may refuse permission for the use of land if the proprietor of the mining enterprise should fail to give a sum for compensation or to furnish a guarantor.

Art. 68. Within the period when the land is used the right of ownership of the property should temporarily be held by the proprietor of the mining enterprise, and its other rights should be temporarily suspended. But this does not apply to the case when no injury will be done to the utilization of the land.

Art. 69. After the use of the land is over the proprietor of the mining enterprise should restore the land to its original condition and return it to the original landlord. If the former condition cannot be restored, thus causing loss to the landlord, compensation should be given, but regarding the case stated in art. 60, it shall not apply.

Art. 70. With regard to the rules governing the use of land, the same shall apply to the right of the use of water.

Chapter V. Miners.

Art. 71. Labourers who work in connection with a mining enterprise are called miners.

Art. 72. The regulations governing the duties of miners fixed by the proprietor of the mining enterprise should be sent to the Director of the Mining Supervision Office in his district for approval before they can come into force.

Art. 73. The proprietor of the mining enterprise shall prepare a book registering the name of miners according to the form furnished by the Ministry of Agriculture and Commerce, and shall keep it in the office of the mining concern.

Art. 74. With regard to the wages of miners, they shall be paid in current money on previously fixed date or dates either in one or two instalments every month.

Art. 75. At the request of the miner the proprietor shall issue to him a certificate, stating plainly the period he has served in the mine, what kind of work he has been doing, his qualifications, his rate of wages and the cause of his dismissal, when he leaves the employ.

Art. 76. In case any miner is wounded, ill, or dies in consequence of his services rendered to the mine, the proprietor shall pay medical or compassionate allowances.

Art. 77. With regard to the age of miners, the hours of work, and the women and child workers, the Minister of Agriculture and Commerce may issue regulations.

Chapter VI. MINING TAXES

Art. 78. The mining tax shall be divided into two classes, 1. tax. on the mining area and 2. tax on the mining product.

Art. 79. The rates of taxes on the mining area are as follow:

(a) During the period of operation for minerals classified as Class 1 of article 6 each mow shall be taxed 30 cents per annum. But with regard to the placers of platinum, gold, tin, and iron in the bed of a river each ten chang in length shall pay a tax of 30 cents per annum. Minerals of class 2 under article 6 each mow shall pay a tax of 15 cents annually.

(b) If it be during the period of investigation the rates for the above tax shall all be reckoned at 5 cents.

Art. 80. The above tax on mining area is distinct from and in addition to the land tax.

Art. 81. The rates of taxes on mining products shall be classified as follows:—

(a) With regard to the minerals of the 1st class of art. 6, 1.5% of the market price of the place where the ores are produced shall be levied.

(b) With regard to the minerals of the 2nd class of art. 6, 1% of the market price of the place where the ores are produced shall be levied.

Art. 82. The tax on the mining area and the tax on mining product as stated in article 79 and article 81 respectively shall be paid in two instalments.

Art. 83. With regard to the third class minerals specified in art. 6 no tax on mining area, or on product will be levied.

Chapter VII. POLICE OF THE MINES.

Art. 84. With reference to the affairs in connexion with police of the mines they shall be managed by the Minister of Agriculture and Commerce and the Director of the Mining Supervision Office, and their regulations shall be fixed by Ministerial orders of the Ministry of Agriculture and Commerce.

Art. 85. If the Minister of Agriculture and Commerce or the Director of the Mining Supervision Office should consider that there is danger or anything that would tend to impair the public interest in connection with the works of the mine, he may instruct the proprietor of the mining enterprise to take precautionary measures or to suspend the work temporarily.

Art. 86. The Minister of Agriculture and Commerce or the Director of the Mining Supervision Office may demand the employment or change of experts employed by the person who has the right to operate the mine. With regard to the qualifications and responsibilities of the above experts they shall be fixed by Ministerial Orders of the Ministry of Agriculture and Commerce.

Art. 87. Within one year of the cancellation of the Mining Right the provisions for precautions against danger shall continue to have force.

The Minister of Agriculture and Commerce, or the Director of the Mining Supervision Office may instruct the original proprietor of the mining enterprise to take precautions against danger.

Chapter VIII. JUDGMENTS, COMPLAINTS AND LAWSUITS.

Art. 88. With regard to the granting or refusing to grant the Mining Rights an appeal may be lodged with the Minister of Agriculture and Commerce within three months of the decision should the petitioner take exception to it. If the decision be against law or causing injury to the right of the party, administrative lawsuits may be brought against the authority concerned.

Art. 89. With regard to the failure to settle the points by consultation provided for in clause 1, art. 35, petitions may be sent to the Director of the Mining Supervision Office for decision.

If the above decision be not agreed to by the party, appeal may be made to the Minister of Agriculture and Commerce. If the decision be against law or causing injury to the right of the party, administrative lawsuits may be brought against the authority concerned.

Art. 90. When the proprietor of the mining enterprise does not agree with the decision for the cancellation for the Mining Right he may appeal to the Minister of Agriculture and Commerce. If the decision be against the law, or causing injury to the right of the party, administrative lawsuits may be brought against the authority concerned.

Art. 91. If no settlement can be arrived at with regard to the use of the surface land the compensation money, or the guarantee, the proprietor of a mining enterprise may petition the Director of the Mining Supervision Office for decision.

With regard to the above decision concerning the use of the land, should either party refuse to accept the decision, an appeal may be sent to the Minister of Agriculture and Commerce. If the decision be against the law, or causing injury to the party, administrative lawsuits may be brought against the authority concerned.

With regard to the decision of the first clause in this article concerning the compensation money and guarantee, if the decision be not accepted by either party, a lawsuit may be brought up in the local Court.

Art 92. If exception is taken with regard to the decision, whether by the defendant or otherwise, the party may appeal or bring an administrative lawsuit within 60 days after receipt of the information of the decision. In cases when the person who appeals or brings such an action has not received a formal decision or an official notice, the period shall be reckoned from the date when the decision is publicly notified.

Art. 93. If foreigners, who have been partners with Chinese citizens in mining affairs, or who have been employed by the Chinese, should have any dispute in connection with mining affairs, the case must be settled by the decision of the Director of the Mining Supervision Office.

Chapter IX. PUNISHMENTS.

Art. 94. Any person who should obtain the Mining Right by fraud, or should secretly operate the mines before obtaining the Mining Right shall receive a punishment of imprisonment not exceeding three years, or a fine not exceeding $3,000.

Art. 95. Any person found secretly selling or mortgaging the Mining Right shall receive a punishment similar to that in the previous article.

Art. 96. If by mistake operations should be carried outside the registered mining area, a fine not exceeding $500 shall be inflicted.

Art. 97. When a person is fined or punished in accordance with the provisions of any of the above three articles, the ore he has obtained shall be confiscated, and if the ore has been sold or made use of, the proceeds should be paid to the authority.

Art. 98. In case of a violation of the provisions of art. 13 or non-compliance with the instructions of art. 85 or art. 87 clause 2, a fine not exceeding $500 shall be imposed.

Art. 99. In case of a violation of the provisions made in art. 27, art. 44, or art. 74, a fine not exceeding $200 shall be imposed.

Art. 100. In case of a violation of the provisions of arts. 54, 72 or 73, a fine not exceeding $100 shall be imposed.

Art. 101. In a case where the proprietor refuses to allow an investigation or stops the officials of the district from investigating the books or articles in connection with a mining enterprise, a fine not exceeding $50 shall be imposed.

Art. 102. Any proprietor of a mining enterprise who tries to evade or has evaded a tax shall be fined three times the amount of the tax.

Art. 103. In case where the provisions of these regulations or orders issued by the authority of these regulations be violated, the following provisions in the Criminal Law should not be followed, viz: commutation, the severer punishment for the repetition of similar offence, or one punishment for several offences put together.

Art. 104. Should the proprietor of the mining enterprise be not an adult person or a man who has been forbidden to undertake any enterprise, the provision for punishment made by these regulations shall apply to his legal agent. But when the person who is not an adult has the same ability as the adult this shall not apply.

Art. 105. When the agent, employe or other person who has been in the enterprise, violates these regulations in connection with a mining enterprise, the proprietor shall not be exempt from the punishment under these regulations on the ground that the offence did not originate with him.

ANNEX.

Art. 106. These regulations shall have force from the date of their promulgation.

Art. 107. Within 6 months of the promulgation of these regulations all the mines which obtained certificates previously shall according to these regulations send in petitions for registration.

Art. 108. Within six months of the promulgation of these regulations all the annual rent for mining area and output taxes hitherto levied according to the old regulations, shall be received accordingly, and those which have not reached the half year, shall be reckoned by the month.

Art. 109. The mining tax on the ores of Class 3 in art. 6, which tax has been instituted as local tax before the enforcement of the present regulations shall continue to be so as heretofore. However, it shall not exceed one-fifth per cent. of the value of the products.

Art. 110. With the exception of those which have been provided for in other laws and orders, the provisions made in these regulations shall apply to the official mining enterprises.

Art. 111. The contracts and agreements made before the enforcement of the present regulations, for the raising of foreign capital for the development of mines, shall continue in force as heretofore.

CHINA STOCK & SHARE HANDBOOK

With each succeeding issue the China Stock & Share Handbook, compiled by Messrs. H. E. Morriss and C. R. Maguire, shows marked signs of improvement. The volume has been enlarged and much new information of value added in the 1913 number.

The book is divided into seventeen sections, and the method of arrangement is such that it is easy to find the information required. Anyone who has any knowledge of such things is aware that the compilation of a book dealing with the affairs of so many industrial and financial concerns of different kinds in various parts of China entails an immense amount of labor and care, and the compilers of the Handbook are to be congratulated upon the successful manner in which they have surmounted all obstacles.

Copies of the Handbook, which is sold for $3 Mexican currency, may be obtained at all booksellers.

RAILWAY TUNNELLING IN CHINA

From a Paper read before the Engineering Society of China at Shanghai by Mr. M. H. Logan.

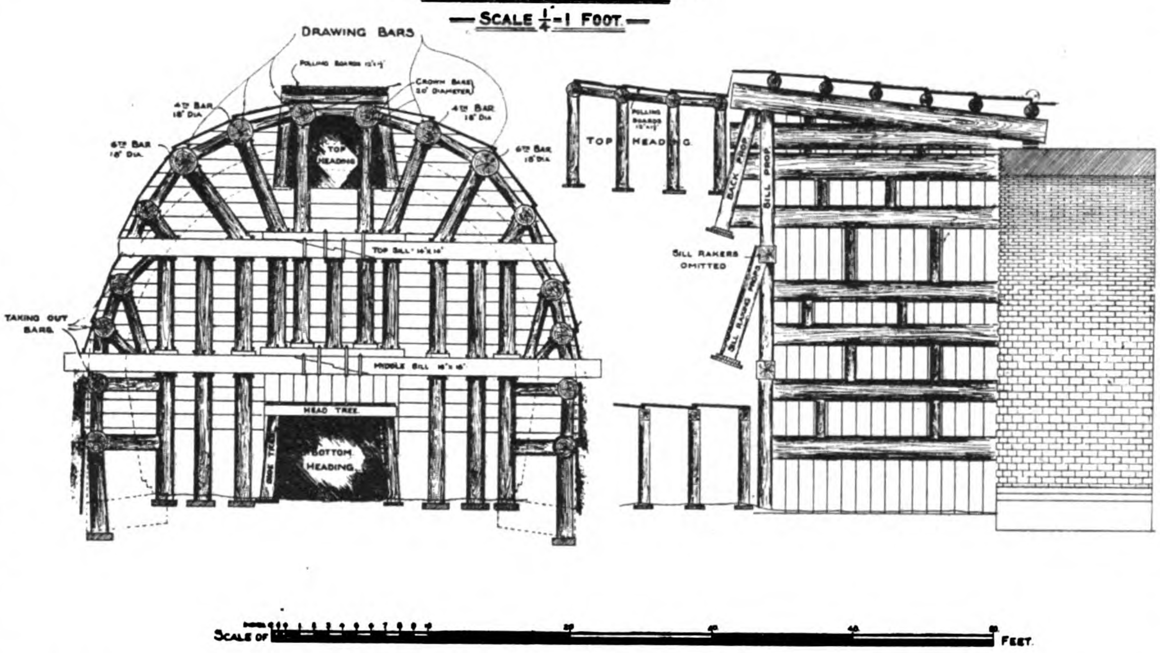
It has been the author's good fortune to have been connected with two great engineering enterprises in which tunnelling played a great part, namely, the hill section of the Assam-Bengal Railway in India, and the British section of the Kowloon-Canton Railway on the mainland of China; the first of these railways traversed from necessity the lower slopes of a valley in which the spurs and bluffs were the remnants of old slips from the main hills, and the tunnelling involved was of a very heavy character; the second railway pierces the Kowloon range of hills in a tunnel nearly a mile-and-a-half in length and then skirts a rugged indented coast line in which are three other tunnels through varying material. It is the author's intention, in this paper, to describe the construction of the tunnels on the Kowloon-Canton Railway, British section, of which there were five, of the following lengths:—

Now. 1.	150 feet.		
,, 2.	7,212	,,	(Beacon Hill Tunnel)
,, 3.	329	,,	
,, 4.	180	,,	
,, 5.	923	,,	(Taipo Tunnel)

All these tunnels, with the exception of the Beacon Hill Tunnel, were built for a double line of rails, the latter on the score of cost being built for a single line only.

The Kowloon-Canton Railway is built on the standard gauge of 4ft. 8½in. and starts at a point on the mainland opposite the centre of the city of Victoria on the island of Hongkong; traversing a piece of reclamation some 40 acres in extent it enters the foothills in a cutting, the vertical depth of which is for several chains over 150ft. and in some places actually 200ft.; the spoil from this cutting was needed for forming the reclamation, otherwise a tunnel would most certainly have been the more economical course to adopt; approaching the main range of hills which divides the harbour of Hongkong from the waters of Mirs' Bay, the railway runs in heavy cutting through a series of foothills and enters the Beacon Hill Tunnel at a point some three miles from the terminus. Emerging from the Beacon Hill Tunnel on the far side of the divide from Hongkong it continues down the Shatin Valley for some two miles and again strikes the sea coast which it follows for about eight miles to Taipo, Mile 13, where it again turns inland and passing the watershed in another very heavy cutting it enters the Sheungshin Valley and follows this to the Chinese frontier at the Samchum River. The work on the British section of the railway is, with the exception of the last five miles, of a very heavy character throughout.

—DOUBLE LINE TUNNEL—
—METHOD OF TIMBERING—
—SCALE ¼"=1 FOOT—



THE BEACON HILL TUNNEL.

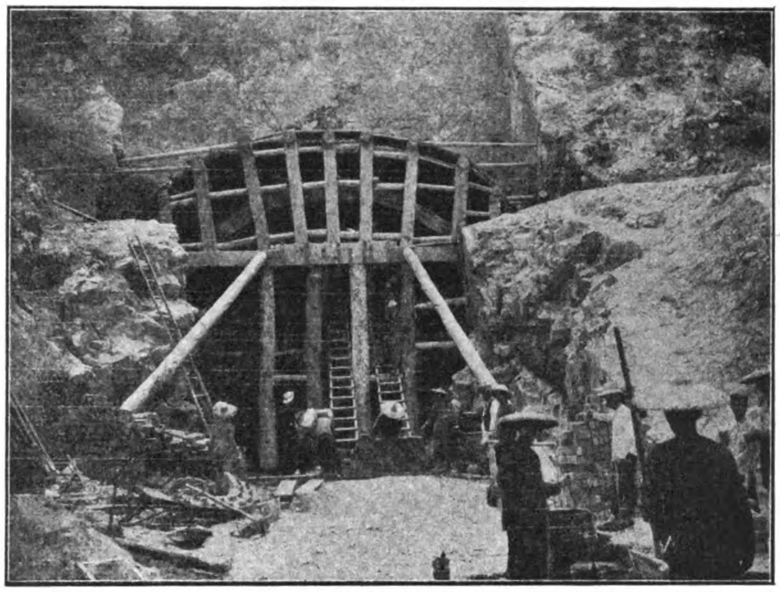
The Kowloon range of hills through which the Beacon Hill Tunnel passes is of granite formation, but the rock is by no means regular, and is for a considerable portion of the tunnel much distorted and decomposed. The approach cuttings at either end of the tunnel were begun in May, 1906, and two shafts were also commenced a month later, the first 98ft. in depth at a point some 350ft. in from the south portal, and the second at the north portal.

Difficulties with labour were considerable at the start of the work, the unhealthy condition of the valleys at the faces of the tunnel proving a great obstacle, malaria fever of a virulent type being prevalent and causing a large amount of sickness among the labour force, both foreigners and Chinese. Chinese contractors from Hongkong were unwilling to undertake work except at rates which were exhorbitant and labour was consequently difficult to obtain; under such conditions it became necessary to import labour, and arrangements were made to obtain a number of skilled tunnel men from India. The large amount of tunnelling on the hill section of the Assam-Bengal Railway completed in 1903 had produced a number of men well trained to such work, and the author being in touch with some of these men was able to obtain within a few months a very useful nucleus of a skilled labour force with which to attack the formidable task of driving a tunnel a mile and a half in length in a country where climatic conditions were adverse and labour with any experience of underground work difficult to obtain. About 150 men were actually imported from India and were followed at intervals by others who were employed on the works as required. The first batch of Indians included men of several races—Pathans from the north-west froncier of India, Mekranies from the littoral of the Persian Gulf, Punjabis, both Sikhs, Hindus, not Sikhs, and Mohammedans and Purbeahs or Hindustanis from the United Provinces; some of these men had but recently worked on the Nushki Tunnel on the Quetta-Seistan Railway on the extreme northwest frontier of India where machine drills had been used and were, therefore, most useful in handling the compressed air-drills which were used on the Beacon Hill Tunnel.

During the months of June, July and August, 1906, in spite of heavy rains and malaria, much development work was done at both faces of the tunnel. Service roads were made, sites for workshops, Power-houses and quarters for the labour force were levelled and buildings erected; reservoirs for water supply were built and a service line of railway on the metre gauge some 2½ miles in length connecting the south face of the tunnel with the main stores depôt at Taikoksui in Hongkong harbour was laid.

The shaft sinking proceeded slowly throughout July and August. Sickness among the labour force, and the large amount of water met with rendering good progress difficult. On September 16, 1906, occurred a disastrous typhoon which wrought immense havoc in Hongkong harbour, and destroyed practically the whole of the temporary matshed quarters and workshops at both faces of the tunnel, resulted in the flooding of the shafts at either face and the drowning of the pumps. The shaft at the north face had by this time reached formation level, and a setting had been got in at each face of the heading, but the sudden flooding, caused by the heavy rain which accompanied the typhoon, caused a cave about fifteen feet from the bottom, and made it questionable as to whether it was worth while attempting to "pick up" the caved-in portion and re-timber it or to wait for the approach cutting. A second typhoon of greater intensity followed close on the heels of the first towards the end of the month, and for the second time in a month the work was brought to a standstill; the temporary quarters and workshops, which had again been erected during the interval, being all levelled to the ground, and the shafts again flooded. This second flooding caused the abandonment of the shaft at the north portal, and efforts were concentrated on the shaft on the south side. At a depth of sixty feet a very tough inelastic decomposed granite was met with, which was badly fissured and yielded an immense amount of water; two Pulsometer pumps of 3in. and 2in. delivery were the only pumps available at the time in the Colony, and it was with the greatest difficulty, baling also having to be resorted to, that the shaft was kept sufficiently free of water to enable the work of sinking to be continued. This tough decomposed granite continued to the bottom of the shaft and on into the hill for several hundred feet, and it was a most intractable material to deal with, tough as leather and yet explosives had very little effect upon it. A pick re-bounded from it and holes could be drilled into it only with difficulty, the grains of quartz continually falling in from the sides of the hole and jamming the drill. A full charge of dynamite produced

practically no effect upon it, and a progress of about 1ft. 6in. in twenty-four hours in either shaft or heading was all that could be effected for several weeks. This toughness was undoubtedly due to the large amount of water with which the material was charged, and when the heading from the approach cutting joined up with the shaft headings and enabled the hillside to be thoroughly drained, a great improvement was noticeable, and the material was then very much more tractable. During the sinking of the last 35ft. of the south face shaft and also for the first 300ft. of the heading, water was encountered in



KOWLOON-CANTON RAILWAY.—Tunnel No. 4.

great quantities, neither candles nor lamps could be kept alight and a small dynamo driven by a Hornsby-Akroyd oil engine was temporarily installed to light the shaft and heading. Much trouble was also experienced with fuses for the explosives owing to the extreme dampness, and eventually submarine fuses were obtained and fired electrically with varying success.

During February, 1907, an 18in. Schram's air-compressor was installed at the south face and towards the end of the month the drills were got to work, both in the shaft headings and the heading from the approach cutting.

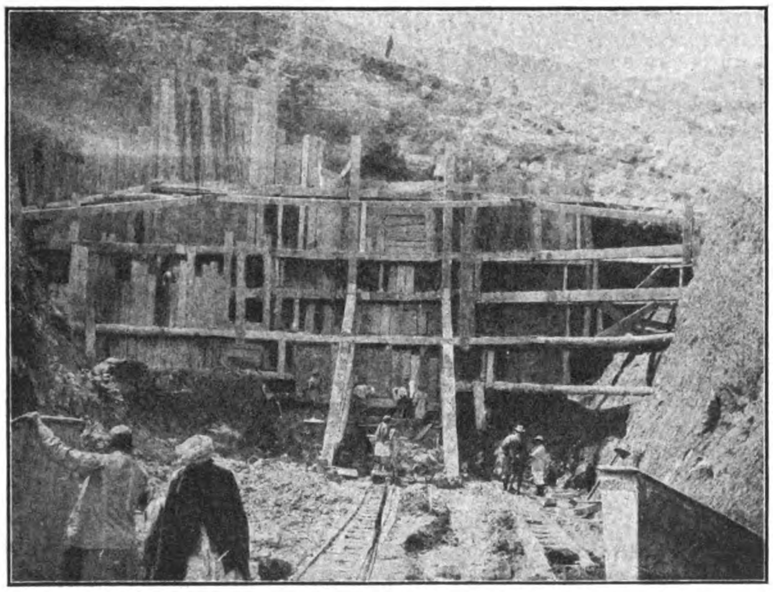
BOTTOM HEADING, NORTH FACE.

The bottom heading at the north face was begun early in January 1907, and made good progress through decomposed granite of a somewhat different character from that met with at the south face. Although better progress was obtained at the north face than at the south, considerable weight came on the heading timbers and it was necessary to close poll all round and to use cill stretchers at the foot of the side trees.

The size of the bottom heading was 8ft. 6in. by 7ft. clear of timber and was sufficient to admit of a metre gauge road being laid up to the working face. The timbering used in the bottom heading at the north face for a length of over 500ft. in from the portal consisted of head tree 12in. by 12in. Oregon pine, side trees, 12in. by 12in. Oregon pine, set on 14in. by 14in. hard-wood foot blocks, cill stretchers 10in. by 10in. Oregon pine, poling boards 12in. by 2in., settings 3ft. 6in. apart. Side trees were given 6in. sprag or rake inwards. Three eight-hour shifts were worked at the beginning of the year and the Indians driving the heading made very good progress through the first 500ft, averaging two settings or 7ft. in the three shifts. At about 500ft. in from the face the ground began to harden and a partially decomposed rubbly rock was met, with veins of decomposed felspar, and the progress, which had up to this point been good, began to fall away; the ground was too hard to mine with the pick alone, and the machine drills, which had by this time been installed, jammed constantly in the rubbly fissured rock. Explosives, too, were most ineffective, the backs or fissures in the rock rendering it difficult to obtain a shattering or even shaking effect; progress continued slow for several months as long as this intractable material lasted, and heavy timbering was required, weight coming on the timbers as soon as the ground was excavated. The great difficulty in driving this heading was to obtain a sumping effect on account of the seamy and decomposed character of the rock. The general scheme of drilling was as follows:—Five or six holes, averaging 5ft., were drilled round the centre of the heading face, radiating towards the centre in the form of a cone; at the sides, bottom and top, other holes were drilled parallel to the direction of the heading; the centre holes were each charged with three to four sticks of blasting gelatine and were given shorter fuses than those on the outside, all being lit simultaneously with a piece of blasting gelatine stuck on the end of a stick and set alight This method of firing was found to be the most satisfactory, two men being employed to fire. The progress obtained in the decomposed rock at each round was generally not more than a foot or 18in., and it was then necessary to dress the face down with picks before the drills could be got to work again. The drills were constantly jamming in the fissures and old holes, and were withdrawn with difficulty. As long as the decomposed rock lasted it was not found necessary to take down the drills off the heading bars on which they were mounted, and they were simply slewed round away from the face and left; as soon as a round of shots had been fired a man went to the face and turned on a compressed air-cock which discharged air into the heading and cleared the face of smoke. In about twenty minutes the men were able to get back to work. The original scheme in driving the tunnel was to push right through with a bottom heading and to put in break-ups at intervals of 500ft., but the slow progress obtained in the very intractable material at the south face of the tunnel during the months of October, November and December 1906 made it seem probable that the completion of the tunnel might be delayed beyond the estimated time, and it was, therefore, decided to put down another working shaft at the north face of the tunnel, at the furthest practicable point in from the portal. This third shaft was begun in January 1907, and was of a total depth of 268ft. It was estimated that it would be down to formation by the end of May, but owing to great delay in the delivery of a sinking pump and other machinery ordered from England which did not arrive until the middle of July, it was well on into September before the shaft reached formation level, and the difficulties encountered in sinking it were great. The size of the shaft was 13ft. by 10ft. clear of timber and as it was intended to use this shaft throughout the construction of the tunnel special twin cages and a hauling engine were ordered from England for the purpose. The first 70ft. was in what is known in the colony of Hongkong as red earth, a form of decomposed granite not difficult to excavate, but requiring timbering and close polling. At 70ft. rock was struck and with the rock water was encountered, which increased in quantity as the shaft went down and the rainy season came on.

The first 30ft. or so of the shaft was sunk with an ordinary jack-roll or wooden windlass and small wooden skips, but from this depth to formation the work of hoisting was performed by an 8 H.P. Lidgerwood hoisting engine with the drum braked by a friction clutch, and iron crane skips containing a third of a cubic yard. The head-gear for the permanent hoisting plant, (which arrived late after the completion) of the shaft was erected at an early stage and consisted chiefly of 14in. by 14in. Oregon pine square timber framed and bolted together. The timbering of the shaft consisted of framed settings of 10in. by 10in. timber 4ft. apart with 1½in. polling boards. A large sinking pump had been ordered from England early in January by cable and was expected to arrive in March, but was not actually delivered until the middle of June, and then with some of its parts missing, so that it could not be utilized until the end of July, and the bulk of the sinking was done under considerable difficulties with two No. 6 Pulsometers, raising 12,000 gals. per hour, working in two lifts, the bottom one pumping into an iron tank fixed at about 85ft. from the surface and the second pump lifting the water from this tank to the surface. In addition to the pumps the hoisting engine and skips were largely employed in lifting water, and baling added largely to the cost of sinking this shaft.

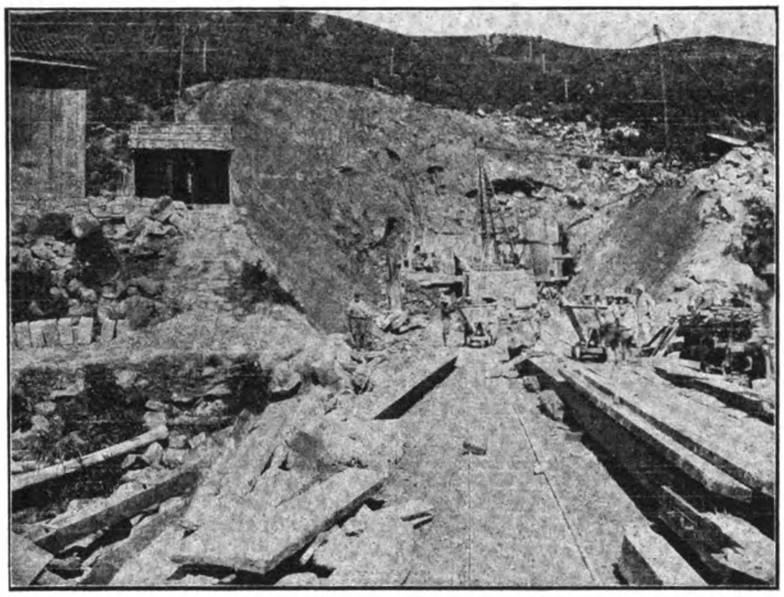
The first 70ft. were sunk by departmental labour, but after this depth had been reached a piece-work contract was arranged with three Italian miners and the remainder of the work in the sinking of the shaft was carried out by them with a grit and determination, working as they were under most difficult conditions, deserving of the very highest praise. Explosives, timber cut to size, all tools and labour for sharpening same,



KOWLOON-CANTON RAILWAY.—Taipo Tunnel, South Face, March, 1908.

coal and all labour connected with hoisting, and lights were supplied to them, and their contract lay in providing labour for excavation and timbering. The rock at this point of the hill was hard, but full of fissures and drilling and blasting were as in the heading matters of difficulty; the fissures were mostly nearly vertical and contained bands of decomposed material, which caused the drills to deflect and jam frequently. A line of air pipes was run up the hill to the shaft from the power house at the portal early in March and extended trials were made with the machine

drills, but the constant jamming in the fissured rock induced the miners to abandon their use and to resort to hand-drilling. The same methods of drilling as were adopted in the heading were resorted to and a series of holes sloping towards a central point in the form of a cone were drilled being heavily charged and fired with short fuses so as to provide a free surface for the straight downward holes to blow to. Progress in the fissured rock was slow and was further retarded by the presence of large quantities of water which found their way in through the joints in the rock, and by the absence of a suitable pump to deal with such quantities. At a depth of 160ft. the hoisting rope began to give trouble, the continued oscillation of the buckets causing the unwinding of the lay of the rope, and it became necessary to reverse the rope and to put in special guides for the skip, the skip itself being rigged on a frame with shoes to fit the runners which were fixed to the shaft timbers. The late delivery of the large sinking pump, the permanent winding engine, and the hoisting cages were responsible for much of the difficulty that was experienced in sinking this shaft. The fissured rock continued down to a depth of 200ft., but after this depth the rock became more solid and the principal difficulty was with water. The shaft was used throughout the construction of the tunnel, and a large amount of the excavated material was hoisted through it thus leaving the portal lengths free for bringing in lining material, timber, etc.



Kowloon-Canton Railway.—Taipo Tunnel, South Face, July 5, 1908.

BREAK-UP LENGTHS

The original scheme, as has already been mentioned, was for a bottom heading to be driven throughout the tunnel and for break-ups to be formed at intervals of 500ft., thus provding two additional working faces in each break-up. It was not found possible to adhere entirely to this programme and eventually break-ups were formed at distances of 250ft.

The face lengths were got out and turned without much difficulty 15ft. lengths being adopted with five drawing bars, namely, one crown bar, two 3rd bars and two 5th bars, but it had been decided to line the opening lengths of the tunnel with granite ashlar masonry, and the setting of this was with Chinese masons, dreadfully slow, and after three lengths had been turned with stone masonry lining at either face, it was abandoned, and brick lining used throughout the remainder of the tunnel.

The break-up lengths in the damp decomposed granite took a considereble time to get out owing to the constant streams of water which descended on the men, and to the heavy timbering which had to be resorted to. In the first break-up length in from the north face a 2ft. diameter Oregon pine crown bar was used, the remaining drawing bars being 20in. in diameter, and this timber was none too strong for the weight encountered, liner bars having to be inserted and propped off formation before the length could be turned.

By March, 1907, the labour force had been augmented by several experienced Chinese miners who had returned from Australia and the Federated Malay States. These men, recruited from the surrounding country, a very useful lot of hand-drillers, and the situation, as regarded labour, continued to improve, until at the completion of the tunnels on the railway it might be said that there were as fine a force of drillers as could be found anywhere outside of Europe or America.

HEADINGS

As the heading advanced further into the hill the rock continued to improve and though hard, compact, and needing a large amount of explosive to obtain progress, it was very much more easy to deal with than the badly fissured and decomposed rock met with in the first 700ft. at either end of the tunnel. The explosive found most suitable was blasting gelatine; the amount used per foot of heading driven varied, in some parts amounting to as much as 30lb. per foot but the general average might be taken at 8lb. per foot.

In the break-up lengths, where drawing-bars were necessary, a top heading were driven at either face of the break-up and, of course, two sets of bars lost at each junction length having to be built in, but this only occurred in the junction lengths in the first 800ft. from the north end of the tunnel, the remainder of the tunnel, being in sufficiently light ground where timbering was necessary, to permit of the taking out of the bars at the junction lengths. The tunnel ribs were made of three 3in. thicknesses of Borneo hardwood, the laggings being of Oregon pine 6in. by 2in.

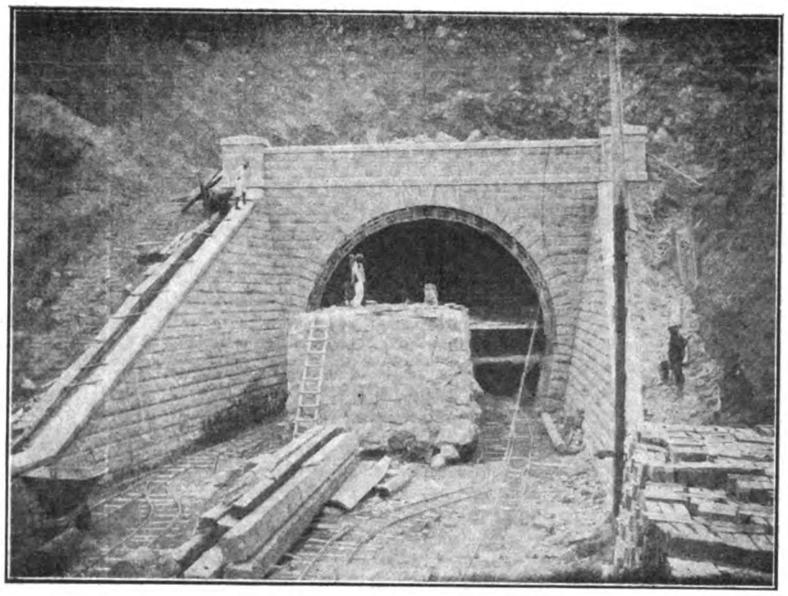
TRANSPORT

The transport of plant and materials was a matter of considerable difficulty as regards the north face, but at the south face a mètre gauge line, some two miles in length, connecting the main store's depôt at

Kowloon-Canton Railway.—View showing slips and masonry of outside length, Taipo Tunnel, South Face, Oct., 1908.

Kowloon-Canton Railway.—Another view showing slips and masonry of outside length, Taipo Tunnel, South Face, Oct., 1908.

Taikoksui with the south face, was completed before the end of 1906. Stores and material for the north face were sent round by sea in junks or lighters towed by steam launches to a store's depôt on tide cove, an inlet of Mirs' Bay, a distance of forty-five miles by sea; from this point they were transhipped into shallow draught boats and conveyed up a shallow river to a point two miles from the north face of the tunnel from which a metre gauge railway was laid to the tunnel. Delays, owing to launches being held up by bad weather on the stretch of coast between the entrance to Hongkong harbour and Mirs' Bay, were frequent, proved a considerable handicap, and were the source of expense.



Kowloon-Canton Railway.—Taipo Tunnel, South Face.

PLANT

The air-compressing plant employed consisted of six Schram-Harker direct-acting steam-driven air-compressors (three at each face of the tunnel) cylinders 18in. diameter and 24in. stroke. The tunnel was lighted throughout by electricity and the lighting plant consisted of four sets of Siemens direct-acting, 14 kilowatt dynamos 100/133 amperes, 100/120 volts, the engines being single cylinder, manufactured by Browett, Lindley & Co. for a speed of 600 revolutions per minute. Arc lamps were employed in the approach cuttings and yards at either face of the tunnel, and the headings and tunnel generally were lighted with ordinary incandescent 16 c.p. lamps. The power plant consisted of a battery of three Lancashire boilers at each 24ft. × 6ft. diameter manufactured by Ruston, Proctor & Co., and at each face there was a steel smoke-stack 100ft. in height with an internal diameter of 5ft.

The drilling machines employed were by the same makers as the compressors with 3½-in. cylinders, and were mounted on columns with horizontal arms, four machines generally being used on the heading driving. It was not found economical as a rule to use the machine drills on the enlargement, and the headings having been driven, the enlarging was done chiefly by hand labour.

The tunnel was completed the end of 1909.

OTHER TUNNELS ON THE KOWLOON-CANTON RAILWAY

Tunnel No. 1, 150ft. in length, was a short tunnel through a narrow neck between two hills and was constructed by two Italians working as sub-contractors for Messrs. Leigh and Orange who had contracted for a length of two and a half miles at the Kowloon end of the railway. It was in red earth or decomposed granite with a few boulders and presented no particular difficulty.

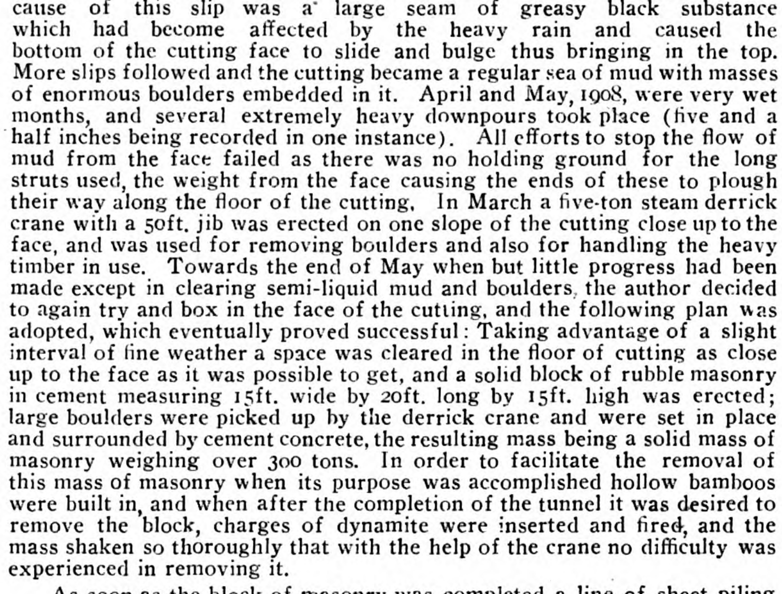
Tunnel No. 3.—329 feet in length is through a rocky spur on the coast section between Shatin and Taipo and is on a five-degree curve, the material is hard rock throughout. A top heading was first driven and this enlarged by hand drilling and blasting and taken down to the level of the springing of the arch when skew-backs were formed in the rock and a brick arching five rings thick turned, the bottom portion being drilled and blasted out afterwards. The sides of the tunnel below the arch were trimmed down and left unprotected, the rock being sufficiently sound. The damage caused to the completed brick arching by the blasting of the lower portion was comparatively slight, and was easily repaired with cement plaster wherever the surface of the brick-work was chipped broken.

Tunnel No. 4. 180ft. in length, was also on a five-degree curve through a spur on the coast section. The upper portion was in an altered decomposed granite, and drawing bars were required throughout its length, one set only being used and drawn through from one face to the other. A top heading was first driven and after two lengths at the north face had been taken out to full section and turned, it was found possible to get skew-backs in hard rock and the arching which consisted of six rings of brick-work was turned and the remainder of the tunnel finished in the same way as No. 3.

Tunnel No. 5.—Taipo Tunnel, 923 feet in length on the straight, proved a very heavy piece of work. The interior of the hill was hard solid granite, but at each face there was a bed of soft decomposed granite interspersed with veins of a soft black greasy substance, lying at an angle on the face of the rock, and at the south face this was affected by the heavy rains of the monsoon season, and gave a great deal of trouble.

The approach cuttings were begun during 1907, and at an early stage the south approach showed signs of giving trouple. The spring of 1908 was very wet, and several small slips took place in February and March; early in April the face of the cutting was shored up with heavy timber and an attempt made to get in a length, a top heading was driven 24ft. into the hill and two crown bars were propped in position, when, after two days of incessant and heavy rain, the bottom of the cutting face bulged outwards breaking the sheeting, and letting in the top; the cills, of which there were four, were of 18in. square Oregon pine timber racked back to the sides of the cutting and these were sheared through clean close to puncheons with which they were propped. The cause of this slip was a large seam of greasy black substance which had become affected by the heavy rain and caused the bottom of the cutting face to slide and bulge thus bringing in the top. More slips followed and the cutting became a regular sea of mud with masses of enormous boulders embedded in it. April and May, 1908, were very wet months, and several extremely heavy downpours took place (five and a half inches being recorded in one instance). All efforts to stop the flow of mud from the face failed as there was no holding ground for the long struts used, the weight from the face causing the ends of these to plough their way along the floor of the cutting. In March a five-ton steam derrick crane with a 50ft. jib was erected on one slope of the cutting close up to the face, and was used for removing boulders and also for handling the heavy timber in use. Towards the end of May when but little progress had been made except in clearing semi-liquid mud and boulders, the author decided to again try and box in the face of the cutting, and the following plan was adopted, which eventually proved successful: Taking advantage of a slight interval of fine weather a space was cleared in the floor of cutting as close up to the face as it was possible to get, and a solid block of rubble masonry in cement measuring 15ft. wide by 20ft. long by 15ft. high was erected; large boulders were picked up by the derrick crane and were set in place and surrounded by cement concrete, the resulting mass being a solid mass of masonry weighing over 300 tons. In order to facilitate the removal of this mass of masonry when its purpose was accomplished hollow bamboos were built in, and when after the completion of the tunnel it was desired to remove the block, charges of dynamite were inserted and fired, and the mass shaken so thoroughly that with the help of the crane no difficulty was experienced in removing it.

As soon as the block of masonry was completed a line of sheet piling was driven across the bottom of the face and along the slopes of the cutting at such a distance that there was room for a retaining wall to be built between the outside of the timber and the edge of the cutting; the lines of sheeting piles were then strongly strutted off the masonry block and the face made good before any further excavation was done in the bottom of the cutting. The mud and boulders in the bottom of the cutting were then removed, a deep grip cut at one side of the cutting and timbered to drain off the water, and an outside length of the tunnel with wing retaining walls



Kowloon-Canton Railway.—Taipo Tunnel. View showing timbering.

built as soon as possible. The sheeting piles at the face were then bored through and cut out carefully one by one to a size sufficient to allow of timber being got in for a bottom heading, and a boxed heading close polled all round was carefully driven, this work being performed by English tunnel foremen, of whom there were at that time four employed on the tunnel; as the heading progressed into the hill large quantities of water were discharged from the surrounding ground, and by the beginning of November 1908 the drainage of the hill-side had progressed so far that it

was considered safe to make a further attempt to get out the face length, a top heading was therefore driven from the face, a board at a time being cut through and the ground beyond it made good before any more of it was exposed and a full set of drawing bars were got in, two crown bars being used; two fourth bars and two sixth bars in addition constituted the set. The top of the length was taken down to cill level, one cill only being used, and from this point downwards closely timbered trenches were taken out for the side walls; the original face, except that taken out for the bottom heading and the side-walls, being still left strutted on to the outside length and masonry block, a good deal of face weight was thus avoided. The same method was adopted for the following lengths until the ground got better and the danger of weight from the face had disappeared, the dumpling left was then removed. In the first three lengths in from the portal short lengths of 9ft. and 12ft. only were taken out and the brick lining was eight rings thick.

NORTH FACE.

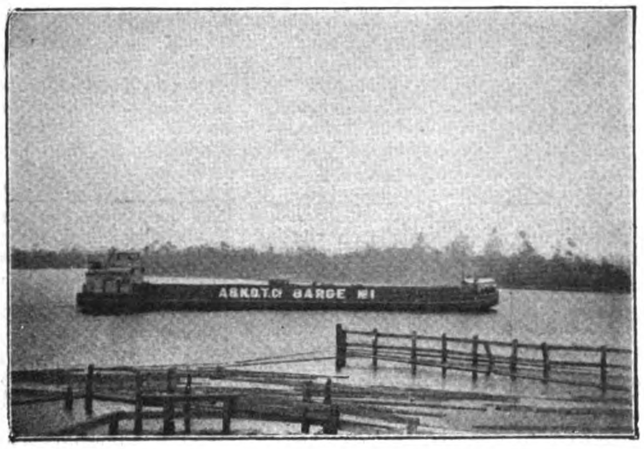
At the north face rock was met with early and the timbering, generally, was not of an extensive character, though even here bands of decomposed material occurred and the rock required careful watching. A small top heading was driven through to a point over the bottom heading coming from the south, and a breakdown was then formed providing two additional working faces. When the solid rock was reached the same method was employed as in tunnels Nos. 3 and 4; the top heading was enlarged to full section down to the springing of the arch and skew-backs formed in the rock, the ribs were then set and the arching, which varied in thickness of from four to five rings of brick-work, turned. The remaining bench was then drilled, and blasted, the working face of the bench being generally some three or four lengths behind the arching. In the rock at the north face of the tunnel a piece-work contract was let to an Italian miner, but at the south face each length had to be taken on its merits and piece-work contracts or bonuses given to the tunnel gangs, according to the material met with. At this tunnel, as at the Beacon Hill Tunnel, a complete system of time-keeping was established early in the work, and the time of all piece-work men and shift gangs was carefully checked. An English time-keeper, with experience on contract work in England, was brought out early in 1906 for the Beacon Hill Tunnel, and the system once established, was extended throughout the line, Indians and Chinese being trained for the purpose.

The staff employed on the construction of the British section consisted of Mr. G. W. Eves, chief resident engineer, with executive charge of the construction work to the south of the Beacon Hill Tunnel, which charge in 1908 was handed over to Mr. R. Baker, assistant engineer, who then became district engineer for the reclamation in Kowloon Bay, and the work south of the Beacon Hill Tunnel. The author was district engineer with executive charge of the northern portion of the British section, which, in 1906 and 1907, included the Beacon Hill Tunnel, during which period all the shafts were sunk, the machinery installed, some 2,000ft. of heaving driven and a considerable amount of widening done in the heavy ground at either face of the tunnel. Messrs. F. W. Valpy and J. C. Steen, assistant engineers, on the latter of whose subdivision tunnels Nos. 3 and 4 were situated, Mr. F. Southey, assistant engineer, and Mr. E. J. Richards. At the end of 1907 the Beacon Hill Tennel was made a separate charge, Mr. W. Waite coming out from England and taking charge of the work as tunnel superintendent, under the chief resident engineer. On Mr. Waite's arrival the author proceeded to Taipo Mile 12 and the remainder of the railway to the frontier of the leased territories was constructed under his supervision, Taipo tunnel being in his direct charge. Mr. Eves was succeeded as chief engineer by the late Mr. E. S. Lindsey, who remained in charge of the railway during the first year of its being open to traffic.

GAS PRODUCER ENGINES IN A NEW FIELD

SELF-PROPELLED BARGES EQUIPPED WITH GAS PRODUCERS AND GAS ENGINES

A fleet of large self-propelled barges, fifteen in number, to ply between New Orleans and the Coal Fields of Northern Alabama is of peculiar interest in that they are the first craft of their kind in America to be propelled by Producer Gas Engines. They are also the first craft to bring coal from the Alabama fields to New Orleans wharves by water.



The first barge of a fleet of fifteen being built by the Alabama & New Orleans Transportation Company for transporting coal from Northern Alabama Coal Regions to New Orleans.

Alabama coal has heretofore been shipped to New Orleans by rail. A glance at a map of the Gulf States shows these barges follow almost as direct a route. Starting from the coal fields they will proceed down the Black Warrior, Warrior and Tombigbe Rivers, across Mobile Bay and proceed to New Orleans by way of Mississippi Sound, Lake Borgne, Lake Borgne Canal and the Mississippi River, a total distance of a little over 500 miles.

The barges are of steel construction, and are similar in design to those in use on the canals of Holland. Their measurements are as follows: Length, 240 ft., Width on deck, 32 ft., Width at bottom, 28 ft., Depth, sides, 8 ft., Depth, center, 8½ ft. Their capacity is 1,000 tons. Draft, when fully loaded, 7 ft. They are propelled by twin screws driven by twin engines and have a speed of approximately 7 miles an hour when fully loaded. The weight of each barge and equipment is close to 240 tons.

The screws are driven at 300 R. P. M. by two 75 H. P. Vertical Producer Gas Engines. Gas for the engine is furnished by a 150 H. P. Producer. The fuel used for the Producer is what has heretofore been a waste coke from the ovens of the Birmingham District and which consequently is secured at a very low price. This coke is practically pea size. It has a calorific value of about 11,000 B. T. U. and the consumption is approximately 1 lb. per horse power hour. Bunkers are provided to hold about 15 tons of fuel. Each producer is equipped with scrubber gas tank, tar extractor and is fitted with water bottom.

While the main power plant is of primal interest the auxiliary power equipment of the barge also merits mention. This consists of a 9 H. P. Gasoline Engine, which drives a centrifugal pump handling the ballast and bilge water, a blower, an air compressor and a 5½ K. W. direct current generator. Current is used for electric lights throughout the boat, fans in cabins and engine room, a 3,200 candle-power search light and 5 H. P. Motor. The arc light is mounted on the roof of pilot house and galley, which are immediately over the engine room. The motor is for operating an anchor winch. The generator is so mounted that when the large engines are running it may be belt driven from one of them. A second 4" Centrifugal Pump is also installed to be driven by one of the large engines through friction wheel contact.

A decided advantage of the self-propelled barge for use in these waters is that they can nogotiate the numerous locks on the Warriors and Tombigbe Rivers in much less time than if towed. Each lock can be passed in 20 minutes by these vessels, whereas more than an hour would be consumed by the towed fleet system.

The barges will make the trip from the Mine region to New Orleans in 72 hours and with all 15 vessels in service it is estimated that coal will be moved into New Orleans at the rate of 50,000 tons a month. Added revenue will be derived by the barges carrying freight on the return trip to the coal field.

The Alabama and New Orleans Transportation Company, of which John H. Bernhard is Vice-President and General Manager, control the Lake Borgne Canal which is the key to the route traversed by these barges, and it is to them that the new departure in Alabama coal transportation is due. All the barges are being built at the company's own ship yard, located at a point about 12 miles below New Orleans, where the canal empties into the Mississippi. The first barge was launched June 4th last. Others have now been launched—it being the company's plan to construct one a month until the fleet numbers fifteen vessels. All the power equipment for the barges—engines, gas producers, motors, generators, pumps, air compressors, etc., was designed and furnished by Fairbanks, Morse & Co.

Loading Naval Stores.

SAKHALIN OIL FIELDS, LIMITED

The first ordinary general meeting of this company was held in London in January, Mr. E. T. Boxall, the Chairman, presiding. In the course of his address the Chairman said that no time was lost in despatching a boring staff to the property as soon as the company was in a position to start business, but delay occurred in securing a vessel to convey the expedition to Sakhalin, owing to the tonnage in Vladivostock being very scarce at the time. The little steamer *Nachodka*, which was eventually secured, proved to be quite helpless in the weather she encountered after leaving Yokohama, and she finally had to return to Vladivostock, where she arrived on November 16, and where the machinery again had to be warehoused for the winter. The expedition subsequently left Vladivostock on February 11 and reached Tchaivo on April 3, where the Russian staff of workmen had been awaiting them since November. The first derrick was completed on May 26 and drilling was started on plot No. 479 at Boatissin. Then occurred the unfortunate incident which prevented work during practically the best part of the summer and explained how it was so little actual boring had been accomplished. As was stated at the statutory meeting, the Russian Government had the company's interests very much at heart and had shown their goodwill in several practical ways, one of which was to grant them five years instead of one in which to prove their claims. Unfortunately the department concerned omitted to inform the local Government mining engineer of this concession, and he, under the impression that the claims had been allowed to lapse, forbade the company's men to do any further work upon them. This occurred in June, and owing partly to delays and discussions between the mining engineer and the manager, but in a much greater measure to the inadequate means of communication (the nearest telegraph office being at Post Alexandrowsk, on the other side of the island), it was not until August that their St. Petersburg colleagues were apprised of what had occurred, and then it was some weeks before they could set the machinery in motion to have the Government mining engineer properly instructed by his department. Finally, operations were resumed in September, and a cable from Mr. George Thom, dated December 2, was received as follows: "Drilling night and day; total 304 ft. Advise where to fix second plant." This confirmed what the board had always maintained, that once a derrick was erected and the men were working under cover drilling could continue throughout the winter. They did not expect to strike oil at Boatissin before reaching a depth of at least 500 ft., which was the point at which the China Oil Company found oil, and they hoped soon to get a further cable from Mr. Thom announcing that he had got down to that depth and found oil. The conditions at Nutvo were different. Oil was met with at a much shallower depth, say at about 350 ft., but they did not know this at the time of Mr. Thom's departure from London, and he left with instructions to commence operations at Boatissin, as it was nearer his base where the machinery was stored and where the expedition was to be housed. They sustained yet another setback, also in consequence of the lack of communication. The letter by which the secretary notified the English staff that their contracts were renewed for a further year miscarried altogether, and the telegram by which the secretary informed Mr. Thom that the letters were on the way was so badly mutilated as to be unintelligible. The result was that two of the remaining four Englishmen, one having been dismissed in the meantime, threw up their jobs and returned home, and had actually left Vladivostock before they could be stopped. This reduced their English staff to two, Mr. Thom and one other, and it was greatly to their credit that they stuck to their posts when they were without news from headquarters and found themselves forsaken by their comrades. This, he was happy to say, exhausted the tale of their reverses, and he would now turn to the brighter side of the picture. It would have been seen that most of their troubles in the past were directly attributable to inadequate means of communication. He was glad to inform them, however, that following representations made to them by their St. Petersburg friends, the Government had expressed their intention of installing wireless telegraphy between Post Alexandrowsk and Tchaivo. If this installation of wireless telegraphy were carried out there would be direct telegraphic communication between London and Tchaivo. As would be seen from the directors' report, Sir Boverton Redwood, the eminent authority on petroleum, sent out at the directors' request an experienced member of his staff, Mr. Francis A. Holiday, to make a thorough examination of the property, to select sites for further drilling, and to advise them generally as to the best method to pursue for working the oilfields to the greatest advantage. He had to inform the shareholders that since the statutory meeting the company had obtained an important concession from the Sakhalin Oil, Coal, & Trading Co., the original owners of the property, and who still owned 154 other oil claims in the same districts. Convinced that oil was abundant throughout the district, and being anxious as shareholders for this company's success, which would at the same time enhance the value of their remaining claims, they had given this company a moving right of selection over the entire 204 claims. That was to say, they were not bound down to the identical fifty claims purchased. If they preferred any other claims that company would give them to this company in exchange for an equivalent number of those which they had had at present. Mr. Holiday arrived at Tchaivo in July and found all the works stopped by the Government engineer under the circumstances which he had related. However, Mr. Holiday made good use of his time during his three months' stay on the island, and although the time was not sufficient for him to visit all the districts, he was there long enough to be able to form a very high opinion of those he did survey. The shareholders had read Sir Boverton Redwood's conclusions from Mr. Holiday's notes, and he might add that the detailed report, of which they were in effect a brief summary, conveyed the fullest possible information respecting the general geological structure of the island, the specific topographical and geological features of the company's various properties, the causes of the non-success of the drilling carried out by others, and recommendations relative to the future work of a company. The document was a lengthy one, extending to more than forty pages of typewritten foolscap, and it would obviously be impossible for him to give at that meeting anything more than an idea of its comprehensive character. Moreover, much of the information which it contained was confidential, which it would not be in their interests to make public, but which was of the highest value for their guidance in the work before them. He must therefore ask them to be content with his three months' study of the properties firmly convinced that the areas over which the company had drilling rights were unquestionably oil bearing, and that with systematic development, judiciously carried out in the manner indicated in the report, and, with adequate capital, satisfactory result should be obtained. Moreover, Sir Boverton Redwood, having carefully studied the data furnished by Mr. Holiday, fully endorsed that gentleman's conclusions. All that they had to do, therefore, was to be patient, confident and persevering, avoiding the mistakes which had been made by others, conducting their exploratory operations in the light of the valuable experience and knowledge of the local conditions which they had already gained, and intelligently shaping their course in accordance with the further information which those operations would furnish. They were in no worse position than that of every pioneer organisation in an undeveloped oilfield, and he merely mentioned that fact in order that they might not be discouraged if their progress were not as rapid as they all naturally wished it to be. They must rest assured that the directors would spare no efforts to bring the properties to a dividend-paying stage of development at the earliest possible date, but their policy should be sure, if slow, and it was only by cautious procedure that the foundations of a permanently successful oilfield could be laid. If they found oil in commercial quantities, as they confidently hoped they would have a rich reward, for at no time in the history of the petroleum industry was an addition to the existing sources of supply in such an important geographical position more urgently needed than it was at present. They were justified in hoping, in fact, that Sakhalin would become one of the world's oil-producing centres. Their market was practically unlimited, imported oils being subject to heavy duties. They had, on the one hand, the whole of the Amur River Valley; in fact, he might say the whole of Siberia up to Lake Baikal, with no competitor nearer than Baku. Whole forests had been devastated in these districts in order to supply the railways and river steamers with wood fuel. On the other hand, they could compete in China on equal terms with other companies. The company's expenses had necessarily been heavy, as was inevitable in any enterprise carried out under pioneer conditions in a practically unpopulated country. They appeared at first sight to be out of all proportion to the results obtained, but if they took into consideration the circumstances and events which it was impossible to foresee, and which hampered their operations, he thought the shareholders must arrive at the conclusion that the company's prospects were excellent. All that was required to realise them was adequate working capital. Turning to home matters, he said that in March the directors concluded a satisfactory arrangement with the vendors whereby they agree to accept 10,000 fully-paid shares of this company in lieu of the £10,000 cash, the balance of the purchase consideration owing to them under the terms of the agreement in consideration of the removal of certain restrictions imposed on the vendors' and promotors' shares. He expressed regret that Sir Richard Awdry, their late Chairman, had been compelled owing to failing health to resign his seat on the board, and that Lord ffrench had also been obliged to resign owing to his other affairs in China preventing his devoting the time to this company's affairs that he considered advisable, but Lord ffrench had offered to conduct any negotiations which this company might wish him to undertake in Peking or the East generally.

OPENING OF GOLD FIELDS IN SIBERIA

According to information received from St. Petersburg, a public tender was held November 30, 1913, at the Mining Department. The allotments formerly belonging to the Northeastern Siberian Co., on the river Volchya in the Chukotsk Peninsula, were allotted to a mining group represented by Baron Drisen

These gold fields, which have not been worked since 1907, regardless of the fact that the deposit is said to contain 15 36 grams of gold in 1 ton of gravel, will be reopened. It is reported that early in the spring of 1914 a large body of workmen, several mining engineers, etc., will proceed to the region mentioned and begin preparations to open up the mines on a large scale.

CHINESE COAL FOR JAPAN

The high price of coal ruling lately has led to the import of Fushun and Chinese coal into Japan. Lately the Osaka Gas Company concluded a contract with the Shosho Yoko, a Japanese firm at Tientsin, sole agents for the sale of Kaiping coal in Japan (including Korea), for a large quantity of the Chinese coal. Almost every steamer from Dairen has been bringing 3,000 or 4,000 tons of coal to Osaka. This contract is only a preliminary arrangement, and the purchase of another 10,000 tons will be contracted for shortly. The daily output of Kaiping coal is about 8,000 tons and when the Lin-si mine is opened, the output will increase to over 10,000 tons. At present most of the Kaiping coal is consumed in and about Tientsin, the remainder being shipped to the South Sea Islands through Shanghai. It is expected that 350,000 tons will be imported into Japan next year, about 200,000 tons have been contracted for by the Imperial Iron Foundry. No. 1 dust coal is to be imported into Osaka by the Mitsui Bussan shortly.

FAR EASTERN RAILWAYS

CHINA

Fukien Railway.—The Ministry of Communications has sent deputies to Fukien to take over the property of the Fukien Railway Company. The construction of this line was begun in the 31st year of the reign of the late Emperor, but less than twenty miles of line has been completed at a cost of two million dollars. The Company requested the Government to nationalise the line.

Chefoo-Weihsien Line.—It is reported that the Chinese Government has, definitely decided to take in hand the building of the Chefoo-Weihsien railway and all who regard this as a vital necessity to the port of Chefoo are anxious that both railway and breakwater should be undertaken at one and the same time. They are the two natural parts of one scheme and with these two developments the future of Chefoo is assured.

The Chekiang Railway.—A correspondent writes from Hangchow on March 1:—To-day a meeting of the shareholders in the Chekiang Railway was held to discuss the question of handing over the railway to the Government, as has been done in the case of the Kiangsu portion. Nothing definite was settled at the meeting beyond the appointment of two deputies who are to go to Peking where they will discuss terms and conditions with the Minister of Communications.

The Lung-Tsing-U-Hai Line.—A correspondent writes from Chengchow, Honan:—The land about here, outside the city and between it and the railway is all being bought up by investors. We gave 30,000 cash a mow for what we bought six years ago, but now the same land is selling for 250,000 cash. Native buildings are going up by the acre. The Pien-lo railway has bought a big tract of land and is now building dwelling houses on it for foreign employees. They tell me one hundred new men, French and Belgians, are expected within a month's time.

Pukow-Sinyangchow Railway.—A flying survey with levels was carried through in the autumn of last year from Wu I to Sinyangchou, with a foreign staff of only two engineers assisted by Chinese surveyors. The final location and survey have now been completed by Mr. C. E. Stewart up to 76 miles from Wu I, and the marking out of the land required is now in progress at the East end, and land purchase will commence at once. Mr. Louis Broome, District Engineer at Sinyangchow takes charge of that end of the line and goes out at once to commence the final survey and location at the West end, where it is hoped very soon to commence buying land for the junction with the Ching—Han Railway, and East thereof. Mr. Ferguson, formerly of the Tientsin-Pukow Railway, has joined Mr. Bourne's staff as District Engineer with residence at Luchowfu, and will go out as soon as conditions permit. A few other Engineers are now arriving from various parts of the world and all the preliminary work will soon be well in hand. Wu I is unfortunate in possessing very little accommodation of any sort; but temporary quarters have been found for the present and until the decision as to the details of junction with the Tientsin-Pukow Railway enable the terminal land to be bought and proper quarters erected.

Railway Work in Honan.—A Kaifeng correspondent writes:—Work on the railway connecting Kaifeng with the Tientsin-Pukow railway is proceeding apace, and we hear that the line between here and Hsuchow is to be completed in about a year. The line is following somewhat the south bank of the old Yellow River. For cost of construction and purchase of land this may be economical, but it means that for nearly two hundred miles it is carried through a sparsely populated and rather barren country, while to have taken a more southern course along the main trade route with Kiangsu would have tapped several large cities and an agricultural and fruit growing country than which there is no better.

Canton-Hankow Railway.—It is expected that shortly embankment work will be in full swing on the three sections of the Hankow-Canton railway between Wuchang and Changsha. The opposition met with from landowners who were unwilling to sell their land at a fair price to the railway has somewhat decreased of late in the vicinity of Wuchang, and a five-mile length of embankment is under construction, while tenders are being received for further lengths.

The construction of the railway between Wuchang and Changsha is being carried out in three sections, Wuchang to Sinti, Sinti to Yochow and Yochow to Changsha. The line is already under construction at Yochow and will meet the Wuchang section about midway. The chief difficulty being experienced is through the disappearance of the pegs which are placed every hundred feet along the route of the railway, these pegs being taken out by the country folk in the hope of getting the railway diverted.

The survey of the Changsha section has been completed, and the purchase of the land is to start shortly, after which work will be commenced. The construction work in Hunan is not to be pushed on just yet. Ten new foreign assistant engineers have been engaged, six of whom have arrived, the others being expected shortly. The new engineers are to supervise the construction work on the spot.

It was at first estimated that through service to Canton would be completed in a matter of three years, but engineers, after surveying the conditions of the country at the Kwangtung border increase the time to about five years, a good deal of tunnelling and cutting having to be done. Notwithstanding that Hunan is a great cereal province and is rich in minerals, it is not expected that returns sufficient to meet even the interest on the loans will be obtained from the railway till the whole length is complete and through service started.

The staff of the railway, who have offices at present in Hankow, may possibly move over to Wuchang after the coming summer, for the building of the railway premises outside the Tung Hsiang gate is under way. When these are completed the railway will be able to save something like $1,000 per month on rent.

Shanghai-Nanking Railway.—The following figures of traffic returns (approximately) for the week ended January 24 are issued by the Shanghai-Nanking Railway:—

Year.	Passengers.	Goods and Sundries	Total for the week.
	$	$	$
1914	64,893	9,710	74,603
1913	50,314	10,509	60,823
Increase.	14,579	—	13,780
Decrease	—	799	—

For thirty weeks.

Year.	Passengers.	Goods and Sundries	Total
	$	$	$
1914	1,418,126	294,860	1,712,986
1913	1,206,239	279,080	1,485,319
Increase.	211,887	15,780	227,667
Decrease	—	—	—

Week ended January 31.

For the week

Year.	Passengers.	Goods and Sundries.	Total for the week.
	$	$	$
1914	38,629	4,414	43,043
1913	55,914	7,830	63,744
Increase	—	—	—
Decrease	17,285	3,416	20,701

For thirty-one weeks.

Year.	Passengers.	Goods and Sundries	Total
	$	$	$
1914....	1,456,755	299,274	1,756,029
1913....	1,262,153	286,910	1,549,063
Increase.	194,602	12,364	206,966
Decrease	—	—	—

*** Only three trains were run on the 26th—Chinese New Year day.

Week ended February 7.

Year.	Passengers.	Goods and Sundries	Total for the week.
	$	$	$
1914....	52,807	9,327	62,134
1913....	41,072	3,163	44,235
Increase.	11,735	6,164	17,899
Decrease	—	—	—

For thirty-two weeks.

Year.	Passengers.	Goods and Sundries.	Total.
	$	$	$
1914....	1,509,562	308,601	1,818,163
1913....	1,303,225	290,073	1,593,298
Increase.	206,337	18,528	224,865
Decrease	—	—	—

Week ended February 14.

Year.	Passengers.	Goods and Sundries.	Total for the week.
	$	$	$
1914	53,149	10,956	64,105
1913	46,732	6,514	53,246
Increase.	6,417	4,442	10,859
Decrease	—	—	—

For thirty-three weeks.

Year.	Passengers.	Goods and Sundries	Total
1914....	1,562,711	319,557	1,882,268
1913....	1,349,957	296,587	1,646,544
Increase.	212,754	22,970	235,724
Decrease	—	—	—

Week ended February 21.

Year.	Passengers.	Goods & Sundries.	Total for the week.
	$	$	$
1914....	41,641	9,129	50,770
1913....	48,656	9,974	58,630
Increase.	—	—	—
Decrease.	7,015	845	7,860

For thirty-four weeks.

Year.	Passengers.	Goods & Sundries.	Total.
	$	$	$
1914....	1,604,352	328,686	1,933,038
1913....	1,398,613	306,561	1,705,174
Increase	205,739	22,125	227,864
Decrease	—	—	—

Week ended February 28.

Year.	Passengers.	Goods & Sundries.	Total for the week.
	$	$	$
1914....	50,339	12,716	63,055
1913....	55,235	11,703	66,938
Increase.	—	1,013	—
Decrease	4,896	—	3,883

For thirty-five weeks.

Year.	Passengers.	Goods & Sundries.	Total
	$	$	$
1914....	1,654,691	341,402	1,996,093
1913....	1,453,848	318,264	1,772,112
Increase.	200,843	23,138	223,981
Decrease	—	—	—

Week ended March 7.

Year.	Passengers.	Goods & Sundries.	Total for the week.
	$	$	$
1914....	53,130	11,570	64,700
1413....	49,627	10,614	60,241
Increase.	3,503	956	4,459
Decrease	—	—	—

For thirty-six weeks.

Year.	Passengers.	Goods & Sundries	Total
	$	$	$
1914....	1,707,821	352,972	2,060,793
1913....	1,503,475	328,878	1,832,353
Increase.	204,346	24,094	228,440
Decrease	—	—	—

JAPAN

Japanese State Lines.—Expenditure for the coming fiscal year on Imperial Government Railways is estimated at over 8,920,000 *yen.* The principal works are as follows:—

	yen
Changes of the trunk line of Tokaido and increase of lines	450,000
Double-track for Yokosuka	300,000
Construction of lines between Uyeno and Central Station in the city (over)	970,000
Double-track for Kyushu line	700,000
Double-track and improvement for Hokkaido Railway	856,110
Construction of cars .. .. (over)	6,020,000

Long Tunnel Finished.—An Osaka report says that the Ikomayama tunnel on the Osaka Electric Railway has been completed. The length is 11,088 *shaku* and work was commenced in July, 1911 by the Ohayashi-gumi, contractors of Osaka, at a cost of 2,500,000 yen. Thirty-four men lost their lives in the work.

New Tokyo Central Station.—A Tokyo paper reports that the interior decoration of the Central Railway Station, the entire outward form of which was completed a few weeks ago, is now being pushed on under the supervision of Dr. Tatsuno. The decorative work inside will combine many features representing the highest art of the leading artists of Japan.

Entering the front main entrance, one finds himself in a spacious hall of 30 *tsubo* paved with gray marble and with no ceiling except the lofty roof. The ceiling has at its four corner stained glass-windows representing the deified forms of a dragon, a tiger, a bird, and a tortoise. The walls will be decorated with mural paintings based on ancient Japanese myths. This work will shortly be begun under the direction of Mr. Kiyoteru Kuroda and Mr. Eisaku Wada. The waiting rooms for passengers take parts of the central hall.

There is a waiting room of 30 *tsubo* at either side of the central hall, connected by a corridor. These side halls will be placed at the disposal of the Imperial suite when the Emperor passes through the station. The floors of those rooms are mosaic work in wood. The walls of the right side room are covered with silk cloth with designs of bamboo plants, while silk wall cloth of designs of plum flowers has been chosen for the walls of the other side room. The ceilings of these rooms are worked in a checker-board design with *hinoki.*

The Imperial room is connected to the left side room by a corridor with marble floor. The room is designed in the shape of an irregular hexagon. The mosaic floor is also the choice for this hall. Elaborate designs of phœnix and of chrysanthemum flowers are inlaid in the clopboards of *hinoki.* The walls are covered with silk cloth with patterns of pine foliage. The ceiling is finished in highly wrought *hinoki.*

A large cloisonné work representing a sunrise is hung on the wall above the mantelpiece. The design was drawn by Mr. Sobun of Kyoto, and made by the Ando factory of the same city, devoting half a year to the work. The chairs, tables, and other articles of furniture will be decorated in novel designs combining Japanese taste and ideal of the Secessionists School. The curtains, alvaperies and portieres will be all stamped with the highest and best of Japanese workmanship.

Traffic Returns.—The cargo handled by the different lines of the Japanese State Railways during January last comes to a total tonnage of 2,503,210 tons, details being as given below:—

	Tonnage of Cargo handled during Jan. 1914. Tons.	Comparison with Jan. 1913. Tons.
Lines in Honshu....	1,515,451	+ 987,759
Lines in Kyushu....	987,759	+ 25,675

Receipts for the same time are as follows:—

	Receipts Jan. 1914. Yen.	Comparison with Jan. 1913. Yen.
Lines in Honshu....	2,887,607	+ 82,534
Lines in Kyushu....	856,848	+ 46,010

This year, as a matter of fact, an appreciation by more than 100,000 tons has been witnessed in cargo handled by different railway lines, but compared with the same time last year the rate of progress shows a decrease. Furthermore a comparison with the record for December last will show the falling-off amounts to more than 28,000 tons.

Of the principal goods handled by the different railway lines rice and coal witnessed a heavy appreciation, while cotton textiles, knitted goods, and charcoal, which see more or less increase at this time of year practically remained stationary.
Companies

Railway Extension in Japan.—The railway lines included in the set program will be wellnigh completed during the fiscal year 1914-15. Therefore the Railway Board is now planning a scheme for the next fiscal year. As a result of the administrative readjustment, however, the construction expenses for the year have been much reduced. That will, it is anticipated, induce the Board to limit the lines to be undertaken during the year to the following lines:—

Sections.	Mileage.
Otoi, Otofu-Wakanai (Hokkaido)....	87
Runnoye-Mashige (Hokkaido)	9
Nobechi-Ominato (Aomori)..........	38
Omagari-Morioka (Akita and Iwate)	47
Yamagata-Sagawa *via* Sagayo and Yachi (Yamagata)	19
Kamabe-Kodzukuri (Aomori)	17
Katsuta-Omiya (Ibaraki)............	13
Yamada-Kochi-Susaki (Kochi)	13
Tottori-Chidzu (Tottori)	20
Yakago-Neame (Tottori)	19

The proposed lines will come to a total mileage of 304 miles, and surveying will be started in the course of the present year.

Kyushu Lines.—The railway east of Miyakonjo on the Miyazaki line, Kyushu, extending some two miles, has been completed and was to be opened to traffic on February 11.

A station has been established at Kabayama, Mitsumata-mura.

Atami Railway.—The Government has abandoned the project of constructing a railway line at Atami, which was included in the Budget for 1914.

MANCHURIA

South Manchuria Railway.—The total traffic receipts of the S. M. R. Co., for the month of January amounted to Y2,143,433, being a decrease by Y564,571 from the corresponding month of last year. It must be borne in mind that the Chinese New Year holidays, preceded by the year end holidays, which extend over at least eight days, occurred in February last year whilst they happened to run this year from the 23rd to the 30th of January. This intervention of the Chinese holidays accounts for the decrease.

There has been a marked increase in the aggregate traffic receipts of the Railway since the beginning of the current fiscal year in April over those for the corresponding period of the preceding fiscal year. Up to last January the Railway received Y18,273,212, as against Y15,486,497 for the corresponding ten months of the preceding fiscal year.

During last February the S. M. Railway received as the traffic earnings the total of Y. 2,083,550, being an increase by Y. 300,161 on the corresponding month of last year. The aggregate receipts since last April reached Y. 20,197,678, being an increase by Y. 2,857,738 on the corresponding period of last year.

Light Rail Line to Fuchou.—The surveys of the proposed light rail line to Fuchou have been finished by experts of the South Manchuria Railway Company. The terminus at the Fuchou end is Wuhutzui, but opinions were divided as to which should be other terminus on the S. M. Railway—Wafangtien or Pulantien. The choice was settled in favour of the latter. It was thought more convenient to have the major part of the line pass through the Leased Territory and only a small portion run through the neutral zone.

SIAM

Prai-Bangkok Connection.—The following is an extract from a speech by the King of Siam on the occasion of his birthday on the 2nd inst. It specifically and authoritatively announces the intention of the Siamese Government to construct the branch which will connect the Kedah-Perlis extension of the F.M.S. Railway with the Southern Siamese east coast main line by a link running from the Kedah boundary through Siamese territory to Octapa the Singora junction:—

"The construction of the Southern Railway Line is being continually proceeded with. On the 1st January of the present year three sections will be open to traffic namely: from Hua Hin to Vang Phong in the province of Pranburi, from Singora to the junction at Uh Taphao, and from Trang to Thung Song in the province of Nagara Sridhamaraj. It has been decided to construct a line branching from Uh Taphao to join with the British railway line on the frontier of Kedah, and this when completed, will enable the exchange of mails between our country and Europe to be accelerated by several days."

MALAYA

The Kedah Railway.—Two Federated Malay States surveyors are now examining the route for the continuation of the Kedah Railway extension into Perlis territory and thence to the Siamese boundary to meet the Siamese Southern Railway. It is proposed to make the extension from Ootapao, the junction for Siggora.

Trans-Peninsula Line.—The *Pinang Gazette* understands that the Federated Malay States Government at present have under their consideration an important scheme for extending the F. M. S. Railway system by a trans-Peninsula line in addition to the Ootapa-Perlis link. The proposals now being considered are for a line which will start at a point in Kelantan, south of Kota Bahru, and will strike due west, through Upper Perak, connecting with the Prai-Taiping line.

It is, of course, well known that both in Upper Perak and in Kelantan there are big areas of rich mining and agricultural lands the development of which is held back through lack of proper communications. A railway line, such as is projected, would open up a most promising district of the Peninsula: it is said that the idea has been favourably received in influential quarters and it is likely to be brought up at an early meeting of the Federal Council.

GENERAL

Irkutsk-Bodaibe Line.—The Governor-General of Irkutsk has forwarded to the Ministry of Finance his views on the question of the construction of Irkutsk-Bodaibe Railway. In the capacity of an applicant for the concession to construct this line of more than a thousand versts appears the Lena Gold Mining Company. In his report the Governor-General points out that with regard to the spacious basin of the Lena, the immediate problem of the State must be consolidation of the gold-mining industry to which end it is indispensable to provide the region with proper means of communication. From this standpoint, however, all projects which look only to the connection of the Siberian Railway with the wharves of the Lena River can not be regarded as satisfying the fundamental needs of the region. Thus, the sole adequate solution of the question is the connection of the Lena basin with the Siberian trunkline by an unbroken railway route. At the same time the Governor categorically declares himself against conferring extraordinary privileges upon private entrepreneurs, more especially the right to impose an increased tariff under which the entire Lena region would be surrendered to the economic exploitation of such speculators.

British North Borneo Railway.—In the course of his address at the 62nd half yearly meeting of the British North Borneo Co., the Chairman, Sir West Ridgeway, said:—

The reconstruction of the railway looms large in our programme. Under the able supervision and control of our general manager, Mr. Watson, satisfactory progress is being made day by day, and we are approaching the time when the shipment of rolling stock, bridge material, &c., &c., will cease. As you are aware, it is our intention to substitute for the old 30-lb. rails of double that weight; and in this connection we have shipped 30 miles of the heavier rail, and shall ship a further 27, making 57 miles in all. That will provide the heavier rail for the section between Jesselton and Beaufort. The substitution of 60-lb. rails on the remaining distance from Beaufort up to Melalap—a matter, in round figures, of 60 miles—will have to be undertaken later on; nothing definite has yet been settled. The cost of what is practically the entire reconstruction of our railway will be considerable. We have already expended some £112,000, and a further considerable sum will have to be spent before the railway has been entirely transformed from a pioneer into a permanent railway. As an instance of what we may expect as the result of this reconstruction, I am pleased to be able to tell you that during the first half of the current year the receipts have been at the rate of £23,000 per annum, which is more than £2,000 better than during the preceding year. Moreover, from cabled reports of receipts since the end of June last, we feel confident that the revenue derived from that source during 1913 will exceed the revenue of 1912 by at least £3,000.

The Amur Railway.—The Blagovestchensk Labor Bureau reports that 20,573 workmen were brought out from European Russia under contract in 1912 to work on the central section of the Amur Railroad. Their wages amounted to $2,181,025. In addition to these men, about 2,560 laborers not under contract were employed during the second part of the season. The total expenditure for labor on the central section of the railroad in 1912 was $2,589,000.

By the time the Amur Railroad is completed in 1916, it is expected that the large coal deposits which exist along the line will be developed sufficiently to furnish the road's fuel supply. The chief deposits are near Malinovka, 8 miles from the railway, between the Tukan and Kivda Rivers. An area of about 1 square mile has been examined, and the indications are that the deposits are regular and cover a large territory. The coal bed averages 7 feet in thickness and lies under 35 to 42 feet of gray clay. The outcrops are on an elevation and not subject to washouts. Working conditions are favorable, and according to the preliminary estimates the coal can be mined at a cost of $1.25 to $1.40 per ton. Coal has also been found on other sections of the railway.

New Railway Freight Tax at Harbin.—The administration of the Chinese Eastern Railway introduced in October last a so-called pood tax on all freight matter received at, or shipped from Harbin. This tax, which is to be collected on each pood (36.1128 pounds) of freight handled by the railway at Harbin, is to remain in force for a period of 10 years, and it is estimated that during this time the revenue will amount to approximately $625,000. This money will be expended chiefly for improving the streets in Harbin, although a certain portion will be used for other municipal improvement.

COMPANIES

China Provident Loan and Mortgage Co., Ltd.—The report of this Company states that the gross earnings for the past year amount to $136,111.77 and after deducting interest paid and all expenses, remuneration to General Managers, consulting committee's and auditors' fees, and adding forfeited dividends, $2,535.20, and the balance of $2,774.55 brought forward from last year's account, there remains a sum of $98,332.76, which it was recommended be appropriated as follows, viz:—

To place to reserve fund	$ 5,000.00
To pay a dividend of 7 per cent. or 70 cents per share	87,500.00
To carry forward of the credit of next year's account	5,832.76

Kowloon Land and Building Co., Ltd.—The twenty-fifth report of the Board of Directors states that the balance of profit and loss account for the year including $806.45 balance brought forward from last account, after writing off all charges and expenses, amounts to $19,172.69. The Directors recommended that a dividend of $2.80 per share be paid, which, after providing for directors' and auditor's fees, would leave a balance of $1,822.69 to be carried forward to the credit of a new profit and loss account.

Taku Tug and Lighter Co., Ltd.—The report of the directors for the year ended December 31, 1913, stated that the result of the year's working showed a balance at general working account of $217,948.09. This enabled the directors to pay to the shareholders two interim dividends of 2 per cent. each in August and November last, and after providing for general expenses, etc., there was a balance of $150,514.38. This available balance the directors recommended should be disposed of as follows, viz.:

By payment of directors' and auditors' fees	$ 5,000.00
By payment to depreciation sinking fund	60,047.81
By payment of a final dividend of 4 per cent	73,714.28
By payment to equalization of dividends account	10,000.00
By carrying forward to 1914	1,752.29
	$150,514.38

Hongkong and Kowloon Wharf and Godown Co., Limited.—The report for the year ended 31st December, 1913, stated that the profit on working was $503,523.06, as compared with $386,011.94 in 1912.

The balance at credit of profit and loss account, including $21,699.74 brought forward from last year, and after deducting directors, and auditors' fees, and paying for all interest and repairs, amounted to $440,402.80, which it was proposed to appropriate as follows:—

To pay a dividend of 7 per cent. from working profits	$210,000.00
To write off Launches	4,757.57
" " Lighters	36,297.88
" " Machinery	18,538.76
" " Kowloon Wharves	36,102.06
" " West Point Wharf	454.61
" " Railways and Rolling Stock	9,361.44
To Transfer to Reserve Fund	100,000.00
To carry forward to new account	24,890.48
	$440,402.80

Shanghai Horse Bazaar Co., Ltd.—The report of the directors for the year ended December 31, 1913, stated that the balance at credit of profit and loss account was Tls. 27,306.89, which the directors recommended the shareholders to deal with as follows:—

	Tls.
A Dividend of 8 per cent.	21,600.00
Carry forward to a new profit and loss account	5,706.89
	Tls. 27,306.89

Central Stores, Ltd.—The report of the directors for the year ended December, 31, 1913, stated that the net profit for the period amounted to $101,873.77, which less directors', auditors' and trustees' fees $2,684.92, interest on debentures $27,397.20, interest on over draft, etc., $432.67, reduction of capital expenses $1,489.86 and reserve for doubtful debts $5,000 amounted to $64,869.12.

This sum the directors propose to appropriate as follows:—To pay a dividend of 10 per cent. on 34,950 ordinary shares, which will absorb $26,218.50; manager's bonus, (5 per cent. on amount of dividend $1,310.90; to place to reserve of the following accounts:—building account $10,000.00, furniture account $3,000.00, and general reserve $15,000.00; and carry forward $9,339.72.

Anglo-German Brewery Co., Ltd. (Shanghai).—The report of the directors for the year ended December 31, 1913, contains the following:—

The balance to credit of profit and loss account, including $5,493.46 brought forward from last year amounts to $76,267.61, which your directors propose to appropriate as follows:—

To be written off: machinery account 10 per cent.	$13,510.11
To be written off: property account 5 per cent.	12,352.04
	$25,862.15
To be placed to reserve account	10,000.00
Dividend to shareholders 8 per cent	35,528.00
Balance to be carried forward to 1914 account	4,877.46
	$76,267.61

Rizal Cement Co. (P.I.)—The meeting of the shareholders of the Rizal Cement Company was held on February 3 at the Manila offices of Messrs. Ynchausti and Company. The report of the company shows that great progress is being made in building the plant, which it is expected will be completed by June of this year.

The report shows that P. 1,005,000 has been subscribed, P. 744,797.50 of which has already been paid up. There are no new shares for sale.

The Rizal Cement Company's plant is located at Matiquio, on the Laguna de Bay. Work was commenced on the plant last October, and up to the present time about one-third of the plant has been constructed, which includes the completion of the barrel manufacturing plant. The cement factory will be 91 meters by 94 meters, and the barrel manufacturing plant, which is now finished, is 50 by 30 meters. The wharf which will extend into the Laguna, will be 400 meters long and six wide. The height of the cement plant will be of different measurements, but at the highest point it will be 23 meters. In all the factories will utilize 10,000 square meters of space. All the work of building is being done by R. Machuca Go Tauco, who contracted to do the work for P. 340,000.

All the machinery has been purchased, which includes a cement plant purchased from Krupp of Magdeburg, Germany, for approximately P124,660: barrel making machinery from Anthon and Sohn of Flensburg, for P. 24,722; the locomotives and engines from R. Wolf of Madgeburg, Germany, for P. 86,878; the aerial cable conveyer from J. Pohlig, of Colon, for P. 58,460; the generators and electric motors from Bergmann and Company, of Berlin, for P. 38,500, and the brick making and refractory plants from Ewers and Sohn of Lubeck for P. 95,000; a grand total of approximately P. 340,720.

Chosen Gas Co.—At the ordinary general meeting of this Company the following profit and loss account was presented:—

	Yen.
Net profit for the term	55,886.324
Bonuses for officials and social expenses	5,580.000
Loss reserve	2,800.000
Balance	47,506.334
Brought over from last account	2,108.342
Total	49,614.676
Legal reserve	2,485.000
Secondary reserve	2,485.000
Dividend at 8 per cent	42,000.000
Carried forward to next account	2,644.676

New Philippines Incorporations.—Incorporation papers have been filed for the Calabaza Plantation Company, a concern organized on the island of Basilan by Japanese with a capital stock of P.20,000 divided into 200 shares of a par value of P.100 each.

The company will carry on a general trading and mercantile business on Basilan island in the Moro province.

TRAMWAYS

Shanghai Tramways.—The returns for the Shanghai Tramways (Foreign Settlement) for week ended January 28, are as under:—

	1914. $	1913 $
Effective receipts (after deducting loss by depreciation of subsidiary coinage)	20,751.02	15,176.55
Passengers carried	1,068,820	743,932
Car miles run	61,872	50,350

The loss by depreciation of subsidiary coinage for the week was $5,898.96 equal to 23.22 per cent. of the gross cash collected on the cars as compared with $3,790.09, equal to 21.38 per cent. for the corresponding week last year.

For month of January with figures for the corresponding month last year.

	January, 1914. $	January, 1913. $
Effective receipts (after deducting loss by depreciation of subsidiary coinage)	84,819.02	68,406.02
Passengers carried	4,370,762	3,325,303
Car miles run	261,624	223,899
Loss by depreciation of subsidiary coinage	23,313.20	16,579.04
Percentage of loss by depreciation of subsidiary coinage	22.71	20.82

Week ended February, 4.

	1914. $	1913. $
Effective receipts (after deducting loss by depreciation of subsidiary coinage)	19,392.60	18,120.54
Passengers carried	1,006,834	898,812
Car miles run	60,223	55,552

The loss by depreciation of subsidiary coinage for the week was $5,668.92 equal to 23.84 per cent. of the gross cash collected on the cars as compared with $4,627.63 equal to 21.50 per cent. for the corresponding week last year.

Week ended February, 11.

	1914. $	1913. $
Effective receipts (after deducting loss by depreciation of subsidiary coinage)	18,064.44	15,692.17
Passenger carried	936,960	754,213
Car miles run	58,122	47,947

The loss by depreciation of subsidiary coinage for the week was $5,221.82 equal to 23.78 per cent. of the gross cash collected on the cars as compared with $4,212.13 equal to 22.56 per cent. for the corresponding week last year.

Week ended February 18.

	1914. $	1913. $
Effective receipts (after deducting loss by depreciation of subsidiary coinage)	18,252.88	15,210.90
Passengers carried	954,050	750,250
Car miles run	61,019	50,661

The loss by depreciation of subsidiary coinage for the week was $5,276.84 equal to 23.80 per cent. of the gross cash collected on the cars as compared with $4,121.13 equal to 22.79 per cent. for the corresponding week last year.

For the month of February 1914, and for two months ended February 28, 1914, with figures for the corresponding periods last year:—

	Feb. 1914. $	Feb. 1913. $
Effective receipts	71,602.99	64,220.04
Passengers carried	3,736,688	3,167,583
Car miles run	235,318	203,830
Loss by depreciation of subsidiary coinage	20,767.90	17,245.78
Percentage of loss by depreciation of subsidiary coinage	23.88	22.54

	Two months ended Feb. 28, 1914 $	Two months ended Feb 28, 1913. $
Effective receipts	156,422.01	132,626.06
Passengers carried	8,107,450	6,492,886
Car miles run	496,942	427,729
Loss by depreciation of subsidiary coinage	44,081.10	33,824.82
Percentage of loss by depreciation of subsidiary coinage	23.25	21.76

Week ended February 25.

	1914. $	1913. $
Effective receipts (after deducting loss by depreciation of subsidiary coinage)	16,197.01	15,244.40
Passengers carried	847,032	761,365
Car miles run	56,437	49,395

The loss by depreciation of subsidiary coinage for the week was $4,685.52 equal to 24.00 per cent. of the gross cash collected on the cars as compared with 22.98 per cent. for the corresponding week last year.

Week ended March 4.

	1914. $	1913. $
Effective receipts (after deducting loss by depreciation of subsidiary coinage)	19,335.58	16,211.91
Passengers carried	1,021,269	816,096
Car miles run	60,118	52,370

The loss by depreciation of subsidiary coinage for the week was $5,736.05 equal to 24.18 per cent. of the gross cash collected on the cars compared with $4,540.51 equal to 23.21 per cent. for the corresponding week last year.

Week ended March 11.

	1914. $	1913. $
Effective receipts (after deducting loss by depreciation of subsidiary coinage)	17,393.30	15,520.89
Passengers carried	928,000	780,533
Car miles run	58,395	49,851

The loss by depreciation of subsidiary coinage for the week was $5,200.91 equal to 24.45 per cent. of the gross cash collected on the cars as compared with $4,415.34 equal to 23.55 per cent. for the corresponding week last year.

Nantao Tramway Co. (Shanghai)—The Chinese Tramway Company at Nantao held its first ordinary meeting on March 8. Mr. Loh Pei-hung, the manager, said the total amount of the receipts since the Company started in August to the end of December last year was $35,751.87 and its expenditure was $32,404.60. The net profit was therefore $3,347.27. Owing to the fact that the capital of the company was $200,000 only, Mr. Loh requested the shareholders to consider a proposal for raising another $200,000 to extend its line. This proposal met with general approval among the shareholders, and will be carried out.

MINING

Tungchiakou Colliery.—The Tungchiakou Colliery is 10 miles northeast of Chinchou. It may be reached by sea from Dairen, the distance being 20 nautical miles northeast of Dairen. A trip in a steam-launch will take about two hours. The Colliery is located on the seashore and faces Meiyao Bay on the south. The water of this small bay rarely

freezes in winter and for this reason the Colliery is open to the access of vessels all the round. It is being worked by Mr. Oyamada, a Japanese resident of Dairen.

There are three layers of coal seams as far as it has so far been ascertained. The uppermost layer is about 3 ft. thick, the intermediate layer 3½ ft. thick, and the bottom one 5½ ft. thick.

A sample of the coal was recently analyzed at the South Manchuria Railway Co. Central Laboratory, Dairen. The result of the analysis are as under:—

Moisture	4.429 %
Volatile matter	9.891 „
Coke non-cohesive	85.680 „
Ash (light reddish yellow) ..	4.698 „
Fixed carbon	80.882 „
Sulphur	0.764 „
Specific gravity	1.442 „
Calorific value	7.635 „
	(Parl formula)

The coal is a semi-anthracite and seems rather deficient in low ash and sulphur, but contains a high percentage of moisture.

It is rather brittle and, while in combustion, it gives a grey smoke in a very small quantity. It emits but little offensive smell. All being considered, it is highly suited for the manufacture of briquettes.

At present the colliery is being worked on an experimental scale and without the use of modern machinery. The obsolete native methods are being followed in excavating shafts and inclines. So little gas is produced in the pits that no artificial ventilators are deemed necessary and the natural draft is thought to answer the purpose quite well. The water in the pits is also so light that it can be removed by hand. For immediate purposes pumps are to be installed against rainy weather.

Federated Malay States Tin Exports.—The complete statistics of F.M.S. tin exports during 1913 is to hand and contains the following totals, cents and catties being omitted:—

Total Tin

	1913. pcls.	1912. pcls.
Perak	493,966	477,240
Selangor	258,825	255,381
N. Sembilan	31,658	29,070
Pahang	57,678	51,778
Total	842,129	813,472

Value in Singapore.

	$ 1913	$ 1912
Peak	49,077,467	49,352,508
Selangor	25,692,609	26,394,756
N. Sembilan	3,155,909	2,998,021
Pahang	5,717,631	5,378,456
Total..	83,643,617	84,123,743

Penchihu Colliery & Mining Co.—At the recent general meeting of the Penchihu Colliery & Mining Co., the Company's capital was increased by Y.3,000,000 to Y.7,000,000. Of this increased amount Y.1,000,000 is to be used for the proposed extension of the mining operations, and the remainder for the proposed manufacture of steel. Y.1,500,000 is to be paid in during the current year and the rest in the course of about three years.

It is understood that the concession for constructing the Penchihu-Chienchang light rail line has been transferred to the Company only in name, the Company having no intention to work the light rail line. It means to let some one experienced in that business undertake both construction and management. The Company will of course secure some privileges when the line is completed.

The Company's program of extension aims at putting out a sufficiency to supply the annual amount of 600,000 tons which will be wanted by the steel works after the program therefor has been completed, and also to meet the demands from the Japanese Navy and the various steel works in Japan.

The iron mine at Penchihu is very rich and it is anticipated that it will be possible to produce about 50,000 tons of pig iron a year after the first part of the working program is finished.

Mineral Output in Chosen.—The mining industry in Chosen has shown a remarkable development of late years. In 1912 the peninsula exported gold to the amount of 9,400,000 *yen*. The export of other metals also reached a total value of 10,000,000 *yen*. The figures given below show the amount of gold purchased by the Japanese mint during the last five years.

	Output at home Kwan.	Output in Chosen Kwan.
1908................	1,069	960
1909................	1,226	1,184
1910................	1,212	1,711
1911...........	1,120	1,849
1912................	1,440	1,440

As will be seen from these figures, the output of gold in Chosen is increasing year by year, while that at home remains practically the same. The output of alluvial gold in Pyangan-do is also on the increase. At Sanan the yearly output amounts to 140 *kwan*. Changsong yields 135 *kwan* of alluvial gold every year.

The industry presents some degree of similarity at Tsan-ju, Kaisong, Nyongpyong, and Funsan also. Chosen supplies some 150,000 *kwan* of iron to the Yawata Iron Works against 300,000 *kwan* of the supply from Tayeh in China.

Gumaos Placer Co. (P.I.)—The annual meeting of this company was held at Manila on February 7. The General Manager's report showed the past year to have been a prosperous one. The actual receipts from bullion shipped were P. 418,342, notwithstanding that nearly three months of the year were spent in going through barren ground in order to get the dredge into place. The best single month's work produced P. 73,657 and the best twelve months' run since the starting of the dredge yielded P. 538,964.

Kailan Mining Administration.—The total output of the Administration's mines for the week ended January 17, amounted to 52,200.15 tons and the sales during the period to 46,631.56 tons.

Week ended January 24, output 20,780.17 tons, sales 46,766.71 tons.

Week ended January 31, output 4,212.89 tons sales 17,164.90 tons.

Week ended February 7, output 31,553.27 tons, sales 34,067.69 tons.

Week ended February 14, output 41,409.42 tons, sales 46,885.66 tons.

LIGHT AND POWER

Extension in Tokyo.—Sanction has been obtained for another foreign loan for electric works in Tokyo. By this means it is intended to raise the mileage of the tramway track from 150 to 200, the number of cars from 1,300 to 1,700, and the number of lights from 280,000 to 460,000. At present the foreign market is not easy enough to make borrowing on easy terms possible, so immediate needs are to be supplied by a syndicate of Tokyo bankers.

New Japanese Company.—A plan is now in progress for the generation of hydro-electricity of 2,600 horse-power by means of the river Natsui, Kawasaki-mura, Ishikirigori in Fukushima Prefecture, Japan. The capital to be invested amounts to 500,000 *yen* in all, or 144 *yen* for each horse-power. The business is to supply electricity and light and manufacture carbide.

Electricity Plant at Fushun Collieries.—The electric plant in connection with the three shafts at the Fushun coal mines has a capacity of 4,500 kilowatts, and the demand for current for operating the light electric railway has made it necessary to increase the capacity of the plant by 3,000 kilowatts. The installation of the supplementary power plant is now under way and will be completed by the end of the year. The electric railway mentioned will also be brought to completion in the near future, and it is expected that the new power plant will supply current in January, 1914. The increasing output of the collieries will necessitate the installation of additional power in the near future, and it is thought that a capacity of at least 13,000 kilowatts will eventually be required to operate the lighting system and provide the needed motive power.

HARBOURS, ETC.

Dalny Harbour.—The appropriation for the South Manchuria Railway Co. Harbour Works Office for the next fiscal year will be about the same as that for the present fiscal year,—about 3,000,000 *yen* The principal items of work will be the reclamation of the shore front at the east of East Quay, the construction of the Northwest Breakwater, the reconstruction of the quay wall on the west side of Main (West) Quay, and the construction of the new third quay to the west of Main Quay. These are all continuations of work now in progress.

SHIPBUILDING

The Taikoo Dockyard.—The steamer *Wuchang*, built for the China Steam Navigation Co., has been successfully launched at the Taikoo Dockyard. The vessel is of the awning deck type, the principal dimensions being as follows:—Length over all 331 feet, breadth moulded 46 feet, depth moulded to awning deck 23 feet 3 inches, gross tonnage about 3,200. The Wuchang is built of Siemens-Martin steel to Lloyd's scantling for special service and equipped to Board of Trade requirements. There are four decks, viz:—upper, awning promenade, and shade. The upper and awning decks run continuously from stem to stern, and the promenade and shade deck from midships to stern. The 'tween decks are arranged for cargo, and have special rooms for carrying mails, silk, opium and treasure.

Accommodation is fitted in a large steel deckhouse on the awning deck for Chinese passengers—16 first class, 36 second class and 154 third class. The crew are berthed forward under the awning deck. Two wood houses are fitted on the promenade deck, one forward for the Captain's accommodation, and one aft containing officers' and engineers' room and dining saloon. The wheel house pilot rooms are fitted in a wood house at the forward end of the shade deck. The vessel will be fitted with all the latest appliances for working cargo, including a special derrick for lifting heavy weights. A steam steering engine is placed on a platform in the engine room, with control shaft leading to the bridge, and there is also provided a steam windlass for working the anchors and cable, two powerful steam winches for working cargo, and a steam capstan aft for the handling of the vessel. Electric light and steam heating will be installed throughout the vessel.

Two sets of triple-expansion engines of the builder's own make are being installed, capable

of developing 1,600 I.H.P. steam being supplied by two large cylindrical boilers working under forced draft on the heated-air closed-ashpit system, the steam used being superheated by Schmidt's system. The vessel is expected to develop a speed of 12 knots on trial.

Other vessels of about similar capacity are at present in course of construction at Taikoo.

Kiangnan Dock and Engineering Works.—Orders have been placed by the Kailan Mining Administration with the Kiangnan Dock for an ice-breaker to deal with the ice in and around the port of Chinwangtao. They have also placed with the same firm an order for a dredger and dredging plant to deepen their harbour to thirty feet at low water. The Russian Government has also contracted with this firm for the construction of two powerful ice-breakers for Vladivostok.

WIRELESS

Station Near Kalgan.—Under instructions from the Ministry of Communications a wireless station has been erected north of Kalgan under the superintendence of Mr. Joh. Hansen, of the East Asiatic Wireless Telegraph Co., Ltd., Shanghai.

Primarily the station is for the convenience of the military forces in this disturbed district, as by its means communication can be easily and quickly established with the station outside the eastern wall at Peking. It will also serve as another link in the chain of wireless which is rapidly being thrown around and across China, for several smaller shore stations have already been fitted up for the Chinese navy. There will shortly be one at Woosung and others have been sanctioned for more southerly districts.

The Kalgan station is of the most modern type and no difficulty has been found in communicating with both Peking and Tsingtau. It has a five kilowatt plant, with an autotype motor of 28 horse power and has comfortable residential quarters for the staff, who are all Chinese, and servants.

It stands in the old camping ground, about half-an-hour's journey from the railway station. The work of building and equipping the station was by no means easy, owing to the nature of the country and a special railway track had to be laid down from the station for the transportation of the materials and apparatus after they had been brought up from Tientsin by rail.

FINANCIAL

Hongkong and Shanghai Banking Corporation.—The half yearly meeting of shareholders was held at Hongkong on February 14th under the presidency of Mr. S. H. Dodwell. In the course of his address he said:—It is gratifying to your directors to be able to meet you again with a report showing a prosperous state of the affairs of the Bank, and an excellent result of the half-year's working. I cannot help remarking that these results are to no small extent due to the wisdom and foresight of our predecessors, in steadily strengthening the position of the Bank by building up its reserves, thus enabling us to do our share in the financing of an increasing trade in the various places where the Bank is established, and to show such satisfactory figures, notwithstanding the keen competition of the present day. Since 1908, the amount paid away in dividends has been £510,000 per annum, representing a high percentage on our capital and reserves. The margin between that large amount and the net profits does not always permit of the reserves being increased on the same scale as in former years, but we are generally in a position to put aside something, and, looking to the future, your directors are convinced that the sound policy of the past should be adhered to, and in good times, when there are surplus profits available, we should continue to build up the reserves of the Bank. The statement of accounts now before you shows a net profit for the half-year's working of $3,324,438.10, to which has to be added $2,052,482.91, brought forward from the previous half-year, making a total of $5,376,921.01 available for appropriation, which your directors recommend be dealt with as follows:—Dividend for the half-year of £2 per share and a bonus of 5s. per share; $200,000 added to the silver reserve fund and $300,000 written off Bank premises account. The balance of $2,067,311.85 to be carried forward to the new profit and loss account. I trust, gentlemen, this distribution will meet with your approval. (Applause.)

As you will notice from the report, our sterling reserve fund investments have again made a claim on the profits. At the end of the half-year the price of Consols stood below our book value of 72, and it was thought advisable to write our holding of £1,200,000 down to 71, and at the same time write down "other sterling securities" by £12,000. This reduced the book value of the sterling reserve fund investments to £1,476,000, and in order to bring the amount up to the full value of the fund, viz., £1,500,000, we purchased £25,000 Australian and New Zealand stocks, which have been placed in the books at £24,000. The cost, viz., £24,356. 2s. 9d., at 1/11.3/16—$252,095.87, was met out of the half-year's profits I think you will agree that it is a wise procedure to have investments written down to a figure inside market prices, at the time of closing our books. (Applause.) The recent sharp recovery in the price of first class stocks, such as our investments are composed of, makes us hopeful that the bottom prices have at last been touched. At any rate, considering our present book values, any further adjustments which may be necessary should be on a small scale, and not prove a heavy tax on profits.

Bank premises account, which we recommend writing down by $300,000 stands at $68 lacs, the increase during the half-year being more than was anticipated when I addressed you in August last, owing to the cost of the London premises exceeding the amount estimated. We moved into the new building in London in October, and the offices have proved most satisfactory in every way. The building is one the Bank may well be proud of and the architect and builders are to be congratulated on the efficient and expeditious manner in which the work was executed. (Applause.) We have recently arranged for the purchase of the building in which we occupy offices in Calcutta, as well as the adjoining lot, thus providing for our requirements there for many years to come. The price is about Rs. 8½ lacs, and as we shall have to build on the extra lot, the total outlay will be a considerable one, but well justified in the opinion of your directors. The Bank has now secured premises in nearly all the places where it is desirable to have its own property, so, as far as can be seen at present, there is no heavy expenditure ahead, except for purposes of rebuilding which may be necessary in the near future in one or two ports. I shall not refer further to the balance sheet, as there are no items of marked importance calling for comment. I would mention that your directors are well satisfied with the loyal and able manner in which the staff have worked, and I think you will heartily endorse our action in voting them a bonus of 10 per cent. on their salaries for the past year (Applause.) I am pleased to say that all of our offices have done well and, with the exception of Bangkok, have been free from losses. The loss at Bangkok was due to trouble amongst some of the rice millers, whose bills on Hongkong and Singapore have been dishonoured, and also to the dishonesty of our own and other Banks' compradores at that place. The amount involved is in the neighbourhood of $6 lacs, and although we hope to recover part of this, full provision has been made in the meantime.

Speaking generally, conditions during the latter half of the past year, like the first six months, were favourable for banking business. Trade continued active, and money in strong demand at remunerative rates in all gold countries. We have had no idle funds in countries working on a gold or fixed exchange basis, as surplus money could be transferred to the most attractive markets without any undue exchange risk. In China, however, the case has been different, as the large accumulation of silver funds could not be utilised, and had to remain more or less idle in Shanghai and the other financial centres. Notwithstanding this unfavourable factor, business, on the whole, was satisfactory both here and in the North. The Canton silk trade experienced a flourishing year, and probably merchants generally have done fairly well in South China, both as regards imports and exports, though, with the exception of silk, the turnover may not have been on a very large scale. In the Yangtsze Valley and the Northern provinces, crops were not quite so good as those of the previous year, but the volume of business was well maintained. The year closed with both import and export trades in a favourable position, and a hopeful feeling prevailing as to the immediate prospects in the North. A serious handicap to trade, however, is the chaotic state of Provincial note issues, to which I am referring later. Kwangtung appears to be suffering in a much greater degree than any other Province in this respect; the steady decline in the value of provincial notes in Canton (the present quotation being about 60 per cent. of their face value) is naturally having a very depressing effect on trade in South China, and until the finances of the Province are put on a sound basis, the business outlook, locally, will continue, to be somewhat gloomy. General conditions in China during the six months under review may be said to have shown a marked improvement. An attempted rebellion in the Yangtsze region last autumn necessitated the assertion of its authority by the Central Government, and the firmness with which the outbreak was quelled has gone far to restore that confidence in the country which is a necessary condition of prosperous trade. The result has been seen in the largely increased receipts of the Maritime Customs during the latter months of the year, the collection for 1913, in fact, exceeding all previous records, and the Customs administration has performed the unprecedented feat of paying the entire service, not only of the ordinary foreign debt secured upon its revenues, but also of the Boxer indemnity, an obligation which, in previous years, has had to be largely met by contributions from the salt and other taxes. With regard to the salt revenue, its receipts under the new administration have exceeded the most sanguine expectations, although the reforms introduced under the able guidance of Sir Richard Dane can only be said to have become effective during the last few months of 1913. Given a continuance of present conditions, it is anticipated that the collection of the current year will yield, on a conservative estimate, a large surplus, which will be available as security for the further borrowing which China must yet undertake in order to carry to its completion her programme of reform. The reorganised Salt Gabelle bids fair, in fact, to rival the Maritime Customs as a great national asset, and illustrates, as does that administration, the advantages which will accrue to China by the employment of foreigners of high character and administrative experience, in the great task which lies before her.

Foremost among the problems with which China has to deal are those of currency reform, and the conversion and rehabilitation of the heterogeneous note circulation with which the provinces have been flooded, the steady depreciation of which, unsupported as it is by any reserve, presents a danger of daily increasing gravity to the country. Enhanced prices, contracted credit and widespread discontent are

the inevitable results of such a state of things, and all other measures of reform become futile until this evil is removed. I may add that the two measures to which I have referred, namely, currency reform and the redemption of the paper currency, as well as the question of the repayment of outstanding short term foreign loans, many of which are now overdue, are at the present moment under the serious consideration of the Chinese Government in consultation with the Five Groups, and a scheme is in preparation which it is hoped will furnish an effective solution of these pressing problems.

Bank of the Philippine Islands.—The Bank of the Philippine Islands held its annual meeting on February 10 when the following officers were slected for the ensuing year:

John S. Hord, president; Eliseo Sendres, vice president; directors, Messrs. E. Calixto, L. Criado, F. de Errazuin, T. L. Hartigan, F. Llanso, M. Velasco, P. C. Whitaker, Felix Roxas.

The usual semi-annual dividend of five per cent was declared.

Singapore Municipal Loan.—Of a loan of $2,000,000 at 4 per cent. offered by the Singapore Municipality only about $1,000,000 was tendered for at 90.

Reported Kirin Loan.—A Peking paper reports that the Civil Governor of Kirin is negotiating a loan of $10,000,c00 with Messrs. Diederichsen and Company. The Governor specially sent Commissioner Jao of Finance to Peking for the purpose of consulting with the Ministry of Finance regarding the terms of the loan and the expenditure of the proceeds. The greater portion of the proceeds will be used to redeem the paper money which causes trouble on the market in Kirin. It is said that the Ministry of Finance has approved of the loan.

The Bank of Taiwan—At the ordinary general meeting of Shareholders of this bank, the profits for the term ended December 31, 1913, were ordered to be disposed of in the following manner:—

	Yen.
Gross earnings for the term	4,802,909.55
Gross disbursements	4,208,835.31
Balance	587,634.24
Brought over from last account ..	237,669.33
Total	826,743.57
Loss reserve	130,000.00
Reserve for equalizing dividend ..	30,000.00
Special reserve	20,000.00
Bonuses for auditors and directors	32,000.00
Dividend at 10 per cent	375,000.00
Carried forward to next account ..	239,763.50

The establishment of branches at Penang and London was agreed to.

Yokohama Specie Bank.—The sixty-eighth half-yearly meeting of the Yokohama Specie Bank was held recently at Yokohama. The following report to shareholders was submitted:—

The gross profits of the Bank for the last half year, including yen 1,229,768.06 brought forward from the last account, amount to yen 23,466,476.79, of which yen 20,048,988.11 have been deducted for interest, taxes, current expenses, rebate on bills current, etc., leaving a balance of yen 3,417,488.68 for appropriation. The directors proposed that yen 350,000 be added to the reserve fund and recommend a dividend at the rate of twelve per cent. per annum, which would absorb yen 1,800,000. The balance, yen 1,267,488.68 was carried forward to the credit of the next account.

New Business Enterprises in Japan.—The "Japan Chronicle" reports:—The total amount of capital invested in new enterprises last year, according to investigations made by the Bank of Japan, amounted in round figures to Yen 380,000,000. Of this, Yen 183,000,000. was for new companies, Yen 142,000,000 for extensions to existing concerns and Yen 54,000,000 represented debentures or temporary loans. Compared with the preceding year the amount of capital invested in new companies showed a decrease of Yen 150,000,000, and extensions of existing concerns a decrease of Yen 4,000,000, but temporary loans and debentures increased by Yen 12,000,000, or a net decrease of new capital invested in business of about Yen 140,000,000. There has thus been a slackening in the activity previously shown in starting new enterprises. The increase in debentures and loans indicates that the handicap on new enterprise consisted largely in the unfavorable state of the money-market, which put a check on the formation of new companies and the extension of existing ones. The amount of capital invested in new companies last year compares with previous years as follows:—

1909	128,257,000
1910	487,000,000
1911	301,139,000
1912	521,108 000
1913	380,373,000

Bank of Japan.—The accounts of the Bank of Japan for the last half-year show a net profit for period of Y. 5,037,646, including Y. 2,122,924 surplus brought over. The profit has been disposed of as follows:—

Dividend on old shares, 6 per cent. per annum	Y.900,000
Dividend on new shares	225,000
Legal reserve	400,000
Reserve for depreciation of property	15,000
Bonuses to officials	180,000
Second dividend on old shares, 6 per cent. per annum	900,000
Second dividend on new shares	225,000
Carried forward	2,192,646

Banque Industrielle Loan.—It was recently reported from Paris that the Chinese loan of f.150,000,000 recently concluded by the Banque Industrielle de Chine was to be issued there towards the end of March through the Credit Francais. It was intended to offer it at f.472½ or at 94 to 94½ per cent. The proceeds are to be used for constructing the port of Pukow and other works, but the money will only gradually be forwarded with the progress of the work.

PERSONAL

The following appointments have been made by the Government of the Philippines:—Public Utility Commissioners, Senor Mariano Cui (chairman) Messrs. Stephen Bonsal and Clyde De Wilt; Secretary to the Governor-General, Mr. Samuel Ferguson; Deputy Collector of Internal Revenue, General Venancio Concepcion; Judge of the Court of First Instance for the 7th Judicial District, Solicitor-General George R. Harvey; Solicitor-General, Delegate Refael Corpus; Member of the Code Committee, Delegate Macario Adriatico; Judge of the Court of First Instance of Mindanao, 14th Judicial District, Judge George N. Hurd; Judge at Large for the Court of First Instance, Judge B. Revilla; Justice of Peace for the City of Manila, Jose Generoso.

Sir Everard Fraser, K.C.M.G., H.B.M. Consul-General at Shanghai returned from England in February and resumed office.

Mr. B. G. Tours, C. M. G., until recently H. B. M's Consul at Nanking, has temporarily assumed charge of opium affairs in the British Legation at Peking while Mr. E. C. Wilton is acting as Chinese Secretary.

It is reported that Mr. Beilby Alston's place as Councillor at the British Legation will be taken by Mr. James William Ronald Macleay, who for the last three years has been First Secretary at Brussels, and who previous to that was in Brazil.

Mr. W. B. Cunningham, Acting-Consul at Dalny, has been transferred to the Embassy, Tokyo. Mr. R. Boulter, attached to the British Consulate-General, Kobe, is to succeed him, pending the return of Mr. Harold G. Parlett (Consul at Dalny) from Tokyo.

Judge S Lobingier, formerly Judge of the Court of First Instance in the Philippines, has been appointed Judge of the United States Court in China.

Mr. Charles L. L. Williams has been appointed American Consul at Dalny.

As the construction of the Philippine Railway in Iloilo and Cebu has been completed, Mr. William B. Poland, Vice-President and Chief Engineer, has resigned. His post will be taken by Mr. R. R. Hancock, at present General Superintendent.

We regret to record the death at Hongkong on March 12 of Mr. Gustav Friesland, managing partner of the Hongkong office of Messrs. Melchers and Co. Mr. Friesland was a director of the Hongkong and Shanghai Banking Corporation and a number of other companies.

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A. F. Craig & Co.

Telephones
The Western Electric Co.

Textile Machinery
A. F. Craig & Co.

Tiles and Bricks
Green Island Cement Co., Ltd.
Chinese Eng. Mining Co.

Tobacco Dealers
British-American Tobacco Co., Ltd.
Cia. General de Tabacos
Olsen & Co., Walter E.

Tools
American Tool Works Co.
Lodge & Shipley Machine Tool Co.
Shanghai Machine Co.
Easterbrook Allcard & Co., Ltd.
The Selson Engineering Co., Ltd.
Shanghai Dock & Engineering Co., Ltd.

Windmills
Defiance Machine Works.

Water Softeners
Babcock & Wilcox Ltd.

Wood Working Machinery
American Tool Works Co.
Defiance Machine Works.
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THE FAR EASTERN REVIEW

COMMERCE :-: ENGINEERING :-: FINANCE

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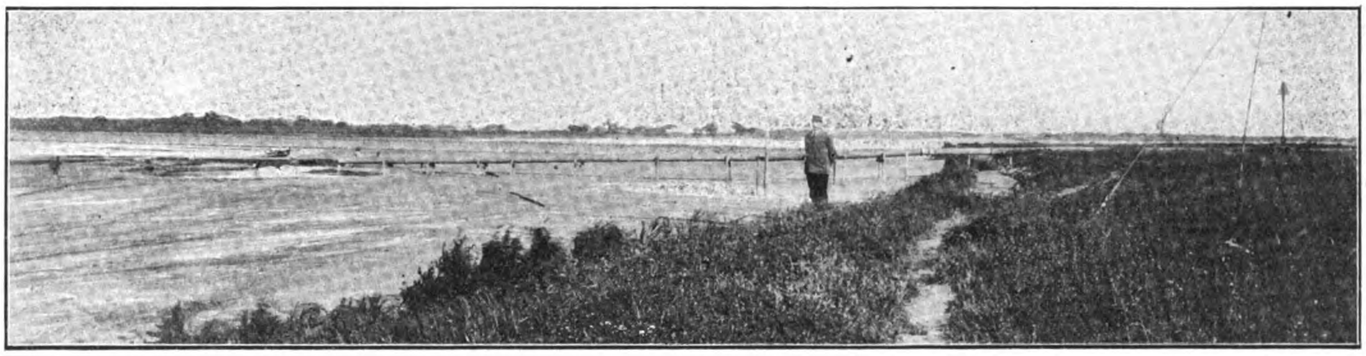
THE WHANGPOO RIVER CONSERVANCY

An historical survey of the measures taken to deepen and improve the riverine approach to Shanghai.

The raison d'etre for Shanghai is the Whangpoo River. It is true that had there been no river there might have been a town or townlet, but there would not and could not have been the Shanghai of to-day; a city that causes visitors to whom it had before been but a geographical term, surprised admiration; a city that inspires in those who live in it a sense of justifiable pride. That this pride is not misplaced is manifested, not only by the magnificent buildings that have been and are supplanting the dingy old places that were good enough for Shanghai in its early youth—as a foreign settlement—but also by the trustworthy figures of the Maritime Customs Reports. In 1864 the total tonnage of shipping entered and cleared was 1,788,059, in 1912 it was 18,368,701. The net foreign imports in 1864 were valued at Haikwan Taels* 12,798,828, in 1912 the value was about Haikwan Taels 210,000,000. Other statistics could be given if necessary to show the proud position that Shanghai occupies among Far Eastern ports, but they would be foreign to our immediate object.

Shanghai, according to Morse, was mentioned in history 2,150 years ago, but the kind of history manufactured in those days is not of interest to present day readers. It really came into foreign purview in 1842 when the city was occupied by British military and naval forces. By the Treaty of Nanking Shanghai was declared a treaty port and was opened to foreign trade on November 17, 1843. The Whangpoo was in a pretty bad condition even then, but the vessels employed in the China trade were of light draft and the bars at the entrance caused little difficulty. The constant increase in the size of vessels and the general employment of steamers instead of sailing vessels, however, began to cause the foreign merchants who had established themselves at Shanghai some disquietude in regard to the future of the port. The outer bar had only about 16 feet of water at low water and the inner bar a depth of 11 to 14 feet. Vessels of any size had to lighter their cargo at Woosung, and smaller vessels had to wait for high water before making the port. This involved delay and expense, and the foreigners quite realized that the obvious thing to be done was to improve the approaches to the port. Unfortunately this realization could not be brought home to the Chinese officials. Old China invariably adopted the attitude of rejecting proposals made to her by the outer barbarian, even though they were obviously in her own interest. This was a case in point. Shanghai was the largest contributor to the revenue derived from the Customs tariff. Any measures to improve the facilities of Shanghai as a port could only tend to the increase of the tangible monetary return obtained by the Imperial Government. But the implacably obstructionist officials of China declined to consider this aspect of the matter. It was quite sufficient that the foreigner had suggested that the approaches to Shanghai should be improved. That was a clear indication, the obtuse officialdom of that day thought, that China's interest lay in allowing them to become worse. In those distressing days, now happily passing, the anti-improvement spirit was so strong in Chinese official circles that actual delight was felt in defeating any proposal intended for the joint benefit of China and those foreigners who had elected to endeavour to develop her trade with oversea countries. The hand of peace in those days could not turn the the handle of the door opening upon larger opportunities. That was reserved for the mailed hand of war. There is not much truth as a rule in generalities, but it may be said that in the past any advantages that China has gained from her association with the civilized world have necessarily been handed to her on the point of the bayonet. This was the case with the improvement of the approaches to Shanghai, and also to Tientsin. The Chinese official view was that the bars at the mouths of the Whangpoo and



Pumping dredged material into the old Ship Channel.

* A Haikwan Tael during 1912 was equivalent to 3s 0⅝d English currency and $0.74 U. S. currency.

the Peiho were heaven-provided barriers against the men-of-war of the barbarian. The Boxer Rising forced China to change her views. After the failure of that luckless effort to drive the barbarians into the sea China had to sign a peace protocol with the eleven Powers interested. Article VI of the final protocol signed in 1901 provided for the payment of an indemnity of 450 millions of Haikwan Taels, and concludes with the sub-clause:—

"The beds of the rivers Whangpoo and Peiho shall be repaired with the financial participation of China."

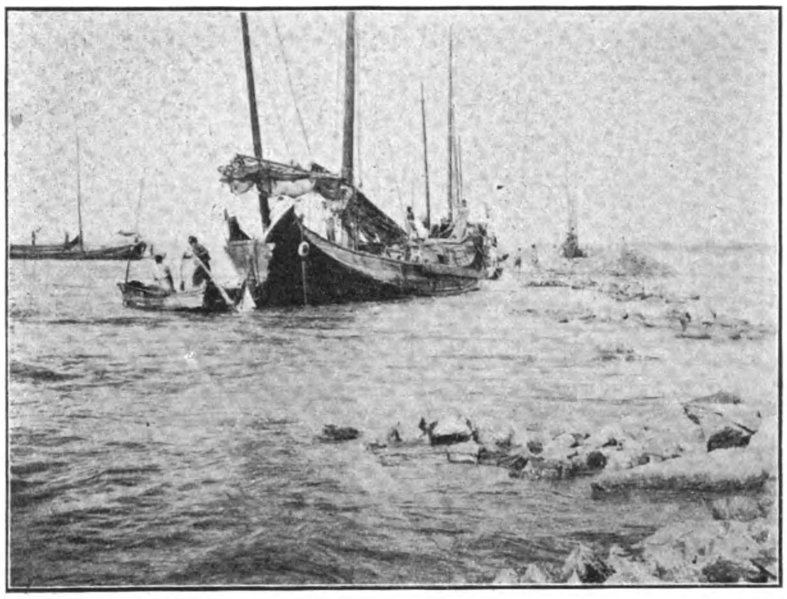
Article XI of the protocol says:—

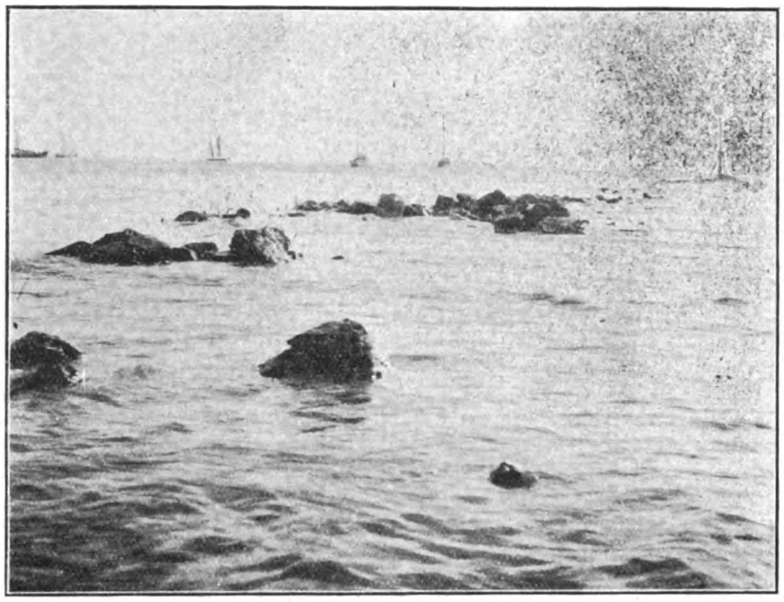
"The Chinese Government has agreed to negotiate the amendments deemed necessary by the foreign Governments to the Treaties of Commerce and Navigation and the other subjects concerning commercial relations with the object of facilitating them.

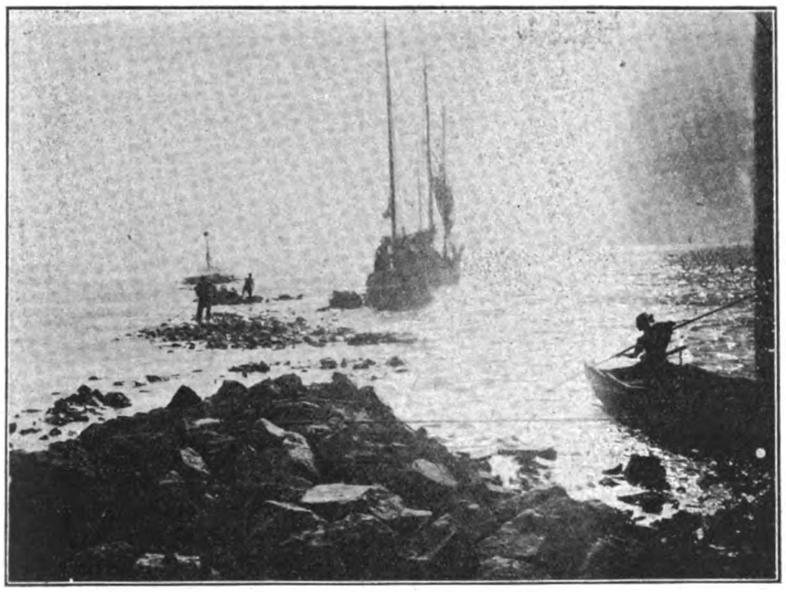
This Board shall consist of members representing the interests of the Chinese Government and those of foreigners in the shipping trade of Shanghai.

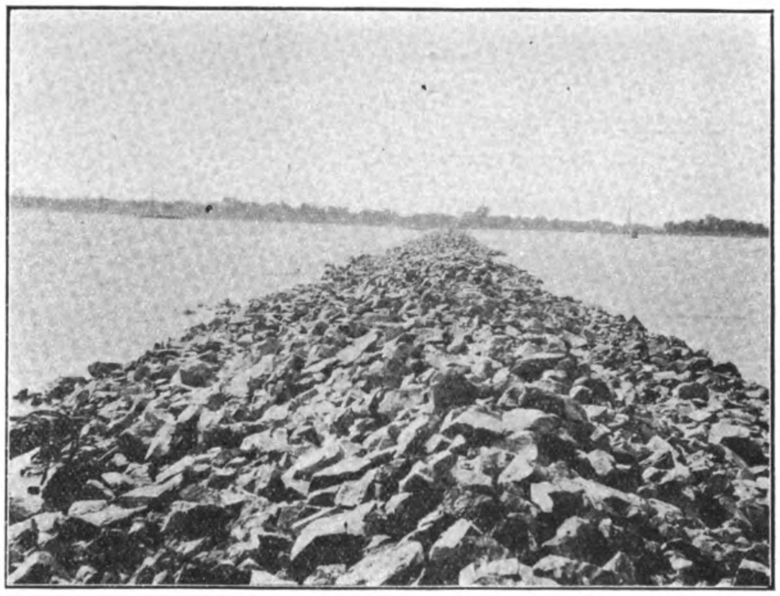
The expenses incurred for the works and the general management of the undertaking are estimated at the annual sum of 460,000 Haikwan Taels for the first twenty years. This sum shall be supplied in equal portions by the Chinese Government and the foreign interests concered.

This was a great triumph for the foreign residents of Shanghai, who at last had a definite undertaking from the Chinese Government that due attention would be given to the modern requirements of the port.* No practical steps were taken, however, until September 1905 when an agreement was entered into between the Chinese Government and the Treaty Powers, providing that the necessary conservancy operations









Four views showing progress of parallel dam work.

At present, and as a result of the stipulation contained in Article VI concerning the indemnity, the Chinese Government agrees to assist in the improvement of the courses of the rivers Peiho and Whangpoo, as stated below

(a) The works for the improvement of the navigability of the Peiho, begun in 1898 with the co-operation of the Chinese Government, have been resumed under the direction of an International Commission. As soon as the administration of Tientsin shall have been handed back to the Chinese Government it will be in a position to be represented on this Commission, and will pay each year a sum of 60,000 Haikwan Taels for maintaining the works.

(b) A Conservancy Board, charged with the management and control of the works for straightening the Whangpoo and the improvement of the course of that river, is hereby created.

should be carried on by the Chinese Government, at its sole expense, under a Board constituted of the Shanghai Customs Taotai and the Commissioner of Customs, with equal powers, with consultative and critical functions reserved for the Shanghai Consular Body. A Government contribution of Hk. Tls. 460,000 per annum during 20 years was pledged for conservancy purposes, and sanction given

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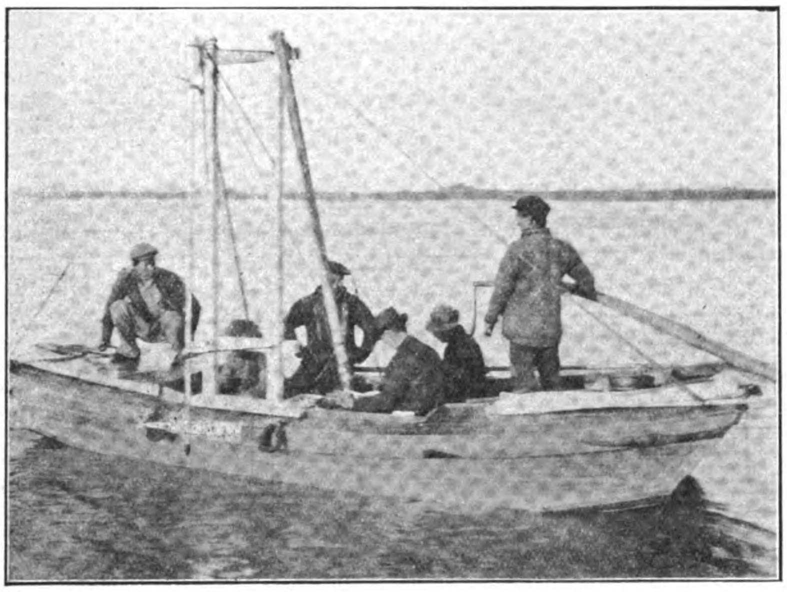
* The history of the conservancy operations which follows is largely taken from a memorandum contributed to the Decennial Customs Reports by Mr. H. von Heidenstam, Engineer-in-Chief to the Board, and from the notes on Conservancy work by the Commissioner of Customs in Shanghai in his yearly reports.

to the taking up of loans, if required, to render greater speed in the work possible.

It was further stipulated that every three months a report on the progress of works and expenditure was to be submitted to the Consular Body, with which Body it rested to make effective representations in case of unsatisfactory progress. The appointment of the engineer to carry out conservancy works was made subject to the approval of a majority of the representatives of the signatory Powers in Peking.

The Whangpoo Conservancy Board, which consisted of Taotai Jui Cheng and Mr. H. E. Hobson, then Commissioner of Customs, began its activity in 1906, and the choice of engineer fell on Mr. J. De Rijke, a Dutch engineer formerly in Japanese Government service, who had previously been called upon to investigate the river, and had submitted schemes for its improvement.



Current meter to depth of 10 feet.

The scheme advocated by De Rijke for dealing with the lower parts of the river embraced two principal undertakings: (1) the training of the river over the Outer Bar by means of a jetty with a shoreconnecting sea dike on the concave Woosung bank and a parallel dam assisted by a group of cribs on the opposite shore; (2) the abandoning and closing of the existing fairway, the Ship Channel, with its "Inner Bar," and the development, by dredging and training, of a shorter route by way of the so-called "Junk Channel" on the other side of Gough Island.

Preparative work, trials, tests, and some temporary protection-work of the Ship Channel bend were started in the summer of 1906; but actual training-work began first in January 1907, with the restraining of the lower entrance of the Ship Channel and, simultaneously, the training of the Junk Channel on the other side of the island. The training of the channel over the Outer Bar commenced on September 19, 1907, with the principal training-works on the left bank, which were called "the Woosung Outer Bar training-works." These works included the long principal jetty, with a shore-connecting sea dike, behind which a reclamation, embracing a shallow work-harbour, was created by pumping up dredged material, and a training-dike or crib a little further up the river. They were all included in one large contract, which was given to a Dutch contractor—the East Asiatic Dredging Company—for a sum approximately Sh. Tls. 2,000,000.

The dredging required for the development of a new fairway through the Junk Channel was started on November 19 under another large contract, made with the same contractors, for $6\frac{3}{8}$ million cubic yards (barge measure), at a price of Sh. Tls. 0.30 per unit, making the total price Sh. Tls. 2,000,000. The work started with only three dredgers—two bucket and one suction,—but two additional bucket dredgers arrived later. The excavating of a 15 feet deep channel through the Junk Channel shallows began just at the upper end of Gough Island in December 1907.

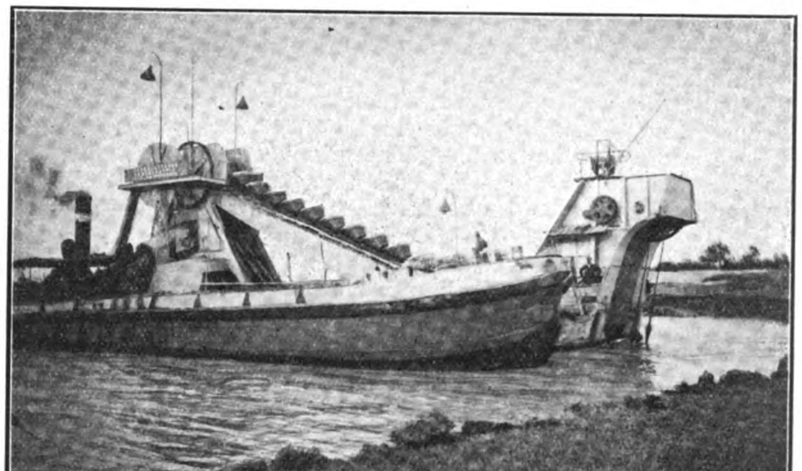
The matter dredged was partly deposited on and between the training-works and partly pumped up to raise certain walled-in areas, which now, having been raised to a height of 14 or 16 feet above low water, represent valuable reclamations. The largest reclamations were made successively at the upper and lower ends of Gough Island and inside the Woosung Jetty, the pumping work forming part of the contract.

From an administrative point of view, the entire work was carried on in three divisions, i.e, (1) the Woosung Outer Bar training-works under one contract; (2) the dredging under another contract; and (3) all other general and training work in Astræa Channel and in the Black Point Beach under the Board's own administration.

The materials used were all of native origin. The brushwood was brought from the Chekiang hills and the stone from the quarries on the coast south of Shanghai. Only the larger timber and piles for the jetty-work had to be imported. The construction of parallel dams and cribs was effected by means of fascine mattresses, made on the well-known Dutch method, and with ordinary fascine-layers, ballasted with rubble stone. Cylindrical bamboo baskets, filled with stone and mantled with brushwood, were also used where speed was a principal requirement.

During 1908 the work progressed steadily and continued to do so also during the first part of the following year. On May 5, 1909, the dredging of the Junk Channel had advanced so far as to allow the British cruiser *Astræa* to pass the new channel at high water, with a draught just under 23 feet. Shortly afterwards this channel was officially opened. From July 1, the traffic was transferred from the old Ship Channel into the new Astræa Channel, and by the end of the year the closing of the Ship Channel had proceeded so far as to render it impassable to all but the smallest vessels.

In July 1909, the dredging contract for $6\frac{3}{8}$ million cubic yards was completed; and in September the additional work, which the Dredging Company had undertaken, free of cost, as penalty for certain irregularities, viz., to dredge 500,000 cubic yards, had also come to an end. All dredging operations were then suspended, on account of lack of funds, until on November 26, a new contract for 1,200,000 cubic yards (barge measure) at Sh. Tls. 0.22 per cubic yard was entered into with the Chinese E. Dsing Dredging Company, who, however, sublet the undertaking to the former contractors. In the meantime, during 1909, the contracted work on the Woosung Outer Bar training-works went on without interruption, and the improved depth of 19 to 20 feet was maintained.



Dredger *Shanghai* at Pheasant Point.

The following year, 1910, saw the completion of two items of the conservancy scheme—in September, the blocking of the old Ship Channel, and, in October, the Woosung Outer Bar training-works. But in September, when the amount contracted for was reached, the dredging of the new channel had to stop, although more dredging was urgently recommended. And the work on the group of training-works, that had been begun on the Pootung shore below Pheasant Point, to assist the Woosung Jetty in improving the Outer Bar, had to be discontinued in November. In the latter part of this month all actual work was suspended, although only half of the outlined conservancy scheme had been carried out and many parts of the work were left unfinished. The Engineer-in-Chief, Mr. De Rijke, whose great work had thus arrived at a deadlock, terminated his engagement in the same month, and the whole staff was disbanded. In December, the appointment, as Mr. De Rijke's successor, of Mr. H. von Heidenstam, Lieutenant, Royal Swedish Corps of Engineers for Road, River, and Canal Works, was approved by the Diplomatic Body.

Tide-gauge installation in the upper river.

During the opening months of 1911 the staff was reorganised on a smaller scale; but in spite of the urgent needs of the half-finished training-works below Pheasant Point, work could not be resumed until April. In December these training-works were practically completed and the Outer Bar had been scoured out by their action, so as to give a depth of 24 feet in the middle of the channel and at least 600 feet between the 20 feet depth curves at lowest low water.

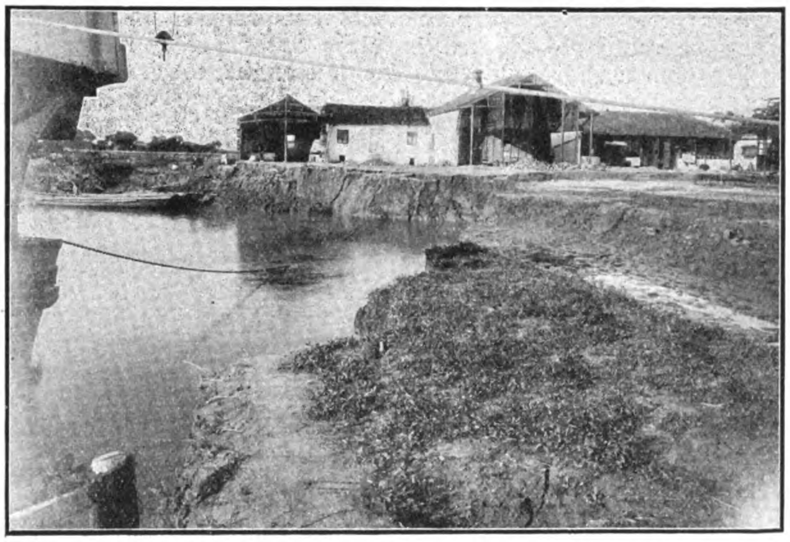
During the year a "Project for the Continued Whangpoo Regulation," with complete details and estimates, was prepared by the Conservancy Engineer-in-Chief, and in October forwarded to the authorities concerned, by whom it was adopted. The estimate for the expenditure required to bring the Whangpoo into a trained and self-maintaining condition so far as practicable, and to produce a clear channel of 24 feet depth at lowest low water and 26½ feet at ordinary low water, was given at Tls. 6,000,000, spread over a period of ten years, these figures being based on the state of the river in October, 1911. Besides the completion of the training-works below Pheasant Point, no other work or dredging could be started, but smaller repairs were duly attended to.

The local results at the Outer Bar had been fully satisfactory in 1911; but the half-finished state of the river regulation produced an unsettled, unfavourable *régime* of the river, resulting in the increased silting at Pheasant Point and the upper part of Astræa Channel. With the adoption of the Engineer-in-Chief's scheme, however, the Board signified that it realized that it was essential to continue the work as a comprehensive undertaking. As already stated an expenditure of Tls. 6,000,000 was to be involved, spread over a period of ten years. The Engineer-in-Chief recommended that a contract should be given for the necessary cutting above and at Pheasant Point and that one dredger, with all necessary plant and a pumping installation, should be purchased. The work for the first three years was to be carried out on the contract system and thereafter the Board's own dredger, it was considered, would be able to keep the river in good condition.

In summing up the advantages of the proposals he put forward Mr. von Heidenstam made the following statement:—"The regulation of the Whangpoo between Woosung and Shanghai is not an isolated undertaking. Its success depends on two exterior and very variable factors, viz. (1) the state of the Yangtsze Estuary, the unchecked vagaries of which might at any time begin to tend to bar Woosung from the Sea, and at the same time reduce the tidal action, and (2) the state of the Upper River above the Upper Harbour Limit, on which the tidal volume is greatly depending.

It is therefore necessary: to follow, closely study and, if required, check the changes of the Yangtsze Estuary, and to establish in the Upper River the adherence to certain rules in order to preserve the tidal capacity of the main river and the chief canals and creeks, the obstruction of which by bridge abutments and fishing-screens in each individual case may be a negligeable quantity, but not when done over and over again.

In these exterior conditions the next ten years are however not likely to bring about any fatal changes; the actual execution and costs will entirely depend on decisive interior conditions for the economically successful realization of this project, namely, that the definite scheme with a preconceived but elastic order of progress is adhered to; that sufficient staff is kept to carry out a rational system of record-keeping, giving at any moment the state and cost of any item or branch of the work, or material, as well as staff to make and prepare continuous hydrographic observations, forming the only reliable guide for present works and future maintenance.



Cutting away Pheasant Point.

Spasmodic operations carried on at intervals without the guidance of continuous economical and hydrographic statistics cannot be safely estimated for, and there is no guarantee against, but much probability for repetition of mistakes and false operations.

An idea, apt to occur to any body investigating this project might be formulated so: 'Would not, instead of this complete scheme at a cost of Tls. 6,000,000, constant or periodical dredging at the four or five places, where present navigation actually is impeded, be just as efficient and cost less?' And the answer is

NOT

OVERSIZED PLACEHOLDER

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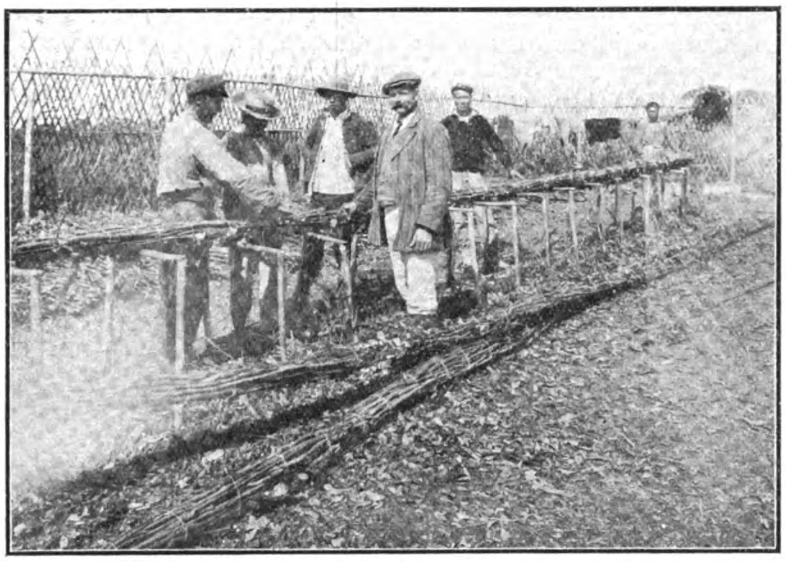


Wiep binding for "Sinkstucks."

this: The navigation may be just as well served by dredging alone and that at perhaps only half the annual cost of the present complete scheme for the next 10 years. But the general deterioration of the river would be only partly checked, its courses would keep shifting and at the end of the 10 years the river would require just as much Conservancy funds as the first year. As elsewhere in nature there is nothing whimsical, accidental or anomalous in the general course of the developments of a river. From many reasons but chiefly on account of the restriction of its entrance, growing worse by accumulation of Yangtsze silt, the lower Whangpoo at present is in a state of diminution. The results of previous conservancy works have alleviated the greatest direct local inconveniences but the scheme not being completed, the cross-sectional areas in the entrance are smaller than ever before during the last decades. The 'shrinking process' is here and has come to stay if the regulation is not continued and kept up, uniting the natural forces at disposal and training them to combined vigorous resistance.

Construction of a "Sinkstuck."

Continuous dredging ad infinitum all over the river is obviously always an available palliative, but effects in each case only a temporary suppressing of the ever increasing and multiplying symptoms of the river's consumptive disease. To rational treatment and cure leads only one royal road: continued training and regulation."

During the early part of 1912 things, however, became critical. The river deteriorated in several places, and strong representations were made to the Government to allow a scheme, put forward by the Shanghai General Chamber of Commerce to be put in operation. Finally in April 1912 a provisional agreement was made between the Chinese Government and the representative of Foreign Powers, providing for a reorganisation of the Conservancy Board and for the raising of funds by special taxation for the carrying on of conservancy work. The reorganised Board,* consisting of the Commissioner for Trade and Foreign Affairs, Mr. Ivan Chen, the Commissioner of Customs, Mr. H. F. Merrill and the Harbour Master, Captain Wm. Carlson, held its first meeting on April 30. The collection of the conservancy tax—3 per cent. of the Customs duties on imports and exports and 1½ per mille of value of duty free good—was begun on May 15, and the proceeds have averaged about Sh. Tls. 42,500.00 per month up to the end of 1913, an amount which seems to assure the carrying out, in due time, of the project for the continued regulation of the Whangpoo, as submitted to the Board in October 1911 by Mr. von Heidenstam, the Engineer-in-Chief.

During 1912, up to the time of the reorganisation, not much new work could be done in the river. The longitudinal dam running parallel with the Woosung Forts Jetty, on the right side of the river, below Pheasant Point (the construction of which had been going on with many difficulties during 1911), was finally completed by the placing of the last stone ballast; and the three cross-cribs, forming part of this same group of training-works, were also finished.

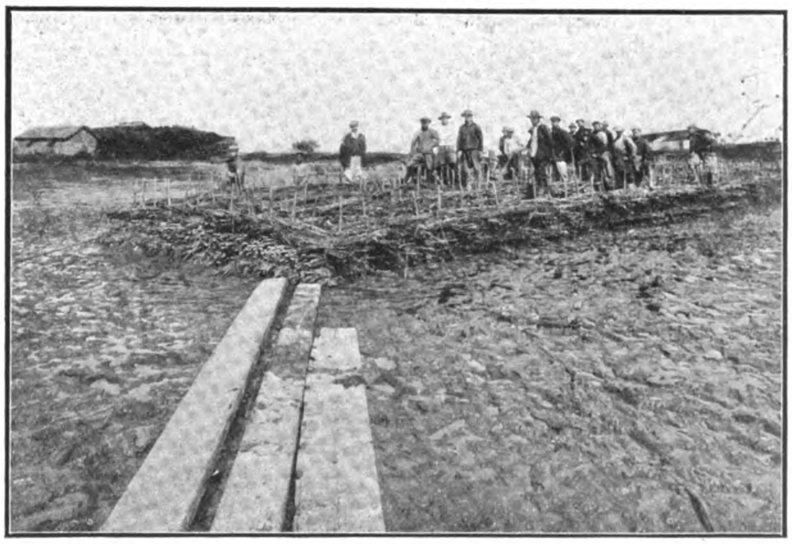
After the reorganisation of the Board† in April and the improvement of its financial status, conservancy activities on a larger scale were again resumed and the Engineer-in-Chief's project for the continued regulation of the river was formally adopted for execution.

The staff was considerably increased, a general reorganisation of the technical and administrative departments carried out, and a set of service rules and regulations and instructions for employes promulgated.

A dredging contract of 4 million cubic yards (barge measure) was made with a Dutch firm, the Netherlands Harbour Works Company, who were the only tenderers in response to the Board's invitation for tenders published on May 1.

*The Board of Directors now consists of Mr. Yang Tcheng, Special Envoy for Foreign Affairs, Mr. F. S. Unwin, Commissioner of Customs and Captain Wm. Carlson, Harbour Master.

†A Consultative Board is formed by one representative for each of the five leading shipping nations appointed by their respective Minister in Peking and one representative for the Chinese Chamber of Commerce. This Board at present consists of Mr. J. N. Jameson (America); chairman, Mr. A. M. Marshall (Great Britain), vice-chairman, Capt. H. Schellhoss (Germany), Mr. L. Bridou (France), Mr. A. Ishii (Japan) and Mr. Y. C. Tong representing the Chinese General Chamber of Commerce.



"Sinkstuck" ready for towing to place of destination.

Two dredgers started in July with the most urgent work on the programme, i.e., the cutting away of Pheasant Point, required in order to make the river conform with the normal lines laid down, and thereby promote the tidal scouring action. Later on, work was started with a third dredger, which was in November transferred to the Upper Astræa Channel, at the so-called De Rijke's Point, where the navigational channel had continuously narrowed. The cutting away of Pheasant Point includes the excavation of the larger part of the present site of the Quarantine Station. In order to create a new site for this station, and at the same time effect an improvement in its sanitary condition which, on account of the very low elevation (about ordinary high-water level) of the ground, has been far from satisfactory, the Conservancy Board decided to reclaim a foreshore area just about the Point and raise it by pumping up dredged material to a height of about 6 feet above the level of ordinary high water.

Dredging and Reclaiming at Pheasant Point.

Pheasant Point Protection.

The depositing of the matter dredged took place by pumping in the difficult reclaimings, by dumping and pumping in the old Ship Channel and by dumping in the Yangtsze, half a mile north-west of the Woosung Forts Jetty. During 1913 the dredging was continued with 3 dredgers, 1 pumping station, 6 tugs and 12 barges at Pheasant Point, and also in the Astræa Channel which was deepened in its central part and widened in its uppermost part. On December 31, 1913 an amount of 3,310,617 cubic yards had been dredged since the start in July 1912. Several valuable reclaimings have been made along the banks.

The first training-dams to be built under the new régime were two cribs above Kajow Creek which were finished in 1912. During 1913 the important training dams in the section of the river between Cosmopolitan Dock and Black Point on the left bank were started. These works consist chiefly of longitudinal training dams parallel to and inside the Normal Line and are carried only to a height of ordinary low water in order not to obstruct the inflow of the flood and to retain as far as possible the tidal storage capacity of the river. At the end of 1913 these works were nearly half completed.

A regular hydrometric survey-service was started in 1912 and there are now in the river six automatic tidegauges, working excellently and rendering possible a valuable control of the tidal action; regular hydrometric current and water measurements are taken at each characteristic tide. The whole upper river has been surveyed, sounded and mapped, as well as one or two of the main tributaries.

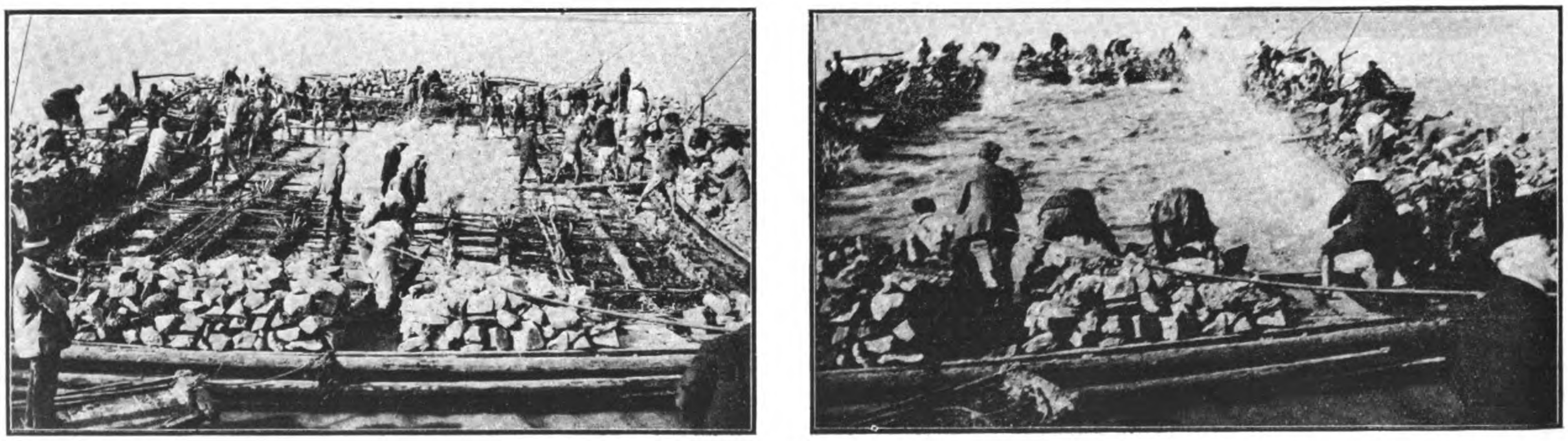
Standard cross sections have been established at the critical and characteristic points between Woosung and the Arsenal as well as in the Upper River and are all sounded regularly half-yearly (once in April after the scouring season, and once in October after the silting season), so that the general state of the river is carefully diagnosed twice a year.

General sounding maps over difficult reaches of the river are made regularly as needed and are supplied to the Authorities concerned.

The general state and regimen of the river, although in several reaches still far from satisfactory, has during the last two years considerably improved.

The general scouring force of the river has been uniformly maintained and at Pheasant Point and in the central Astræa Channel proved itself capable to maintain better than expected the results achieved by dredging.

With the exception of the reach off the Wayside Bar in the Harbour, where the depth is only about 23 feet in mid-channel, the fairway has everywhere a depth of 24 feet, at low water of extraordinary spring tides, over a width of from 500 to 600 feet.



Sinking Brushwood Mattresses.

Looking towards the future, there are still many large works to be done, before the Whangpoo can be considered regulated, and before it will have reached the aim of every river-regulation, i.e., as far as possible self-maintaining state. Such are, for instance, the training works on both sides of Pootung Point, the large dredging cuts opposite Cosmopolitan Dock, at Pootung Point, Chinese City, etc., amounting to several million cubic yards, which all are planned for in detail. In order to deal with the dredging work, including facilities for wharf-owners to get increased depths at their wharves by dredging at cheap rates, the project of the Engineer-in-Chief further provides for the purchase of a dredging plant to be operated by the Board. If the work is allowed to proceed steadily and no tidal waves or other extraordinary events overthrow all human calculations, there seems adequate reason to hope that within a few years the Whangpoo up to the Upper Harbour Limit will offer navigators a through fairway of more than 24 feet at Lowest Low Water over a width of from 600 to 900 feet.

In a speech before the Shanghai Saturday Club on May 17, 1913, Mr. von Heidenstam, however, pointed out a couple of facts, which will have a very great influence on the future of Shanghai as a port. After speaking of the work being and to be done in regard to the river he said:—"The question of the deep-water approach to Shanghai is, however, not entirely solved thereby. An ocean-going ship bound for Shanghai must before entering the Whangpoo pass the so-called Fairy Flats in the Yangtsze Estuary, 25 miles below Woosung, where there is only 17 feet of water at Lowest Low Water at present. To deal efficiently with the Yangtsze Estuary involves, however, either very large operations or otherwise large risks, as an arm of the river, where a smaller scheme might be carried out may entirely upset the scheme by taking another course. Any extensive improvement of the Yangtsze Estuary will probably prove to be an expensive undertaking, but no doubt such work has to and will come."

The success of the Whangpoo and Haiho conservancy works under experienced foreign control should inspire in the Government a determination to adopt a comprehensive scheme for the regulation and improvement of all the waterways of China. A good beginning has been made. The Hwai River Agreement is another big step forward. But there remains much to be done. Other rivers that periodically spread devastation and death have to be controlled, harbors that are now shallow and shipless and unsheltered have to be deepened and protected, and canals that have become choked through neglect have to be restored until they once more arteries of commerce. When these great works are taken in hand an era of abiding prosperity will have begun in China.

SUMMARY OF EXPENDITURE, 1906—1913.

Year.	Interest on 4½ Million Taels Loan.	Staff, Plant, Maintenance, Etc.	Dredging by Contract	The Woosung Outer Bar Training Works, by Contract.	Training-Works and general Works under own Administration.	Yearly Total.
	Sh. Tls.	Sh. Tls	Sh. Tls.	Sh. Tls.	Sh. Tls.	Sh. Tls.
1906	—	100,601.62	—	—	9,391.31	109,992.93
1907	—	178,019.34	—	46,946.05	300,830.13	525,795.52
1908	—	201,267.51	625,000.00	766,821.47	680,788.27	2,273,877.25
1909	65,625.00	208,697.59	507,614.00	675,940.70	464,318.30	1,922,195.59
1910	170,625.00	172,819.47	770,274.61	487,460.52	388,637.12	1,989,816.72
1911	269,062.50	185,695.36	375,000.00	39,955.96	41,499.94	911,213.76
1912	—	84,052.35	163,888.19	—	37,017.28	284,957.82
1913	—	141,395.99	560,487.22	—	58,439.29	760,322.50
Total	505,312.50	1,272,549.23	3,002,264.02	2,017,124.70	1,980,921.64	8,778,172.09

AMERICAN-PHILIPPINE COMPANY

Despite the pessimism in some quarters about the future of the Philippines it is evident that capital is not quite so timid as it was said to be. The American-Philippine Company, which has a capital of P. 1,000,000 has organized the Visayan Refining Company with a capital of G. $500,000, to engage in the production of coconut oil. The plant is to be erected near the town of Cebu, and will have a capacity of 75 tons of oil per day.

The vice-president and construction engineer of the American-Philippine Company, Mr. David Fox, and Mr. Edward B. Thompson, who is to superintend the erection of the plant are now in the Philippines, and it is hoped that in a year's time the Visayan Refining Company will be in full operation.

HWAI RIVER CONSERVANCY SCHEME

Writing from New York under date March 19 Mr. C. D. Jameson, stated that Messrs. J. G. White & Co. had taken over the entire work in connection with the Hwai River Conservancy scheme upon a percentage basis. Messrs. J. G. White & Co. will furnish the money required to carry out the work. Mr. Jameson hoped to return to China in June next with some of Messrs. J. G. White & Co.'s engineers to study the floods if such should occur this year.

UNITED STATES STEEL PRODUCTS CO.

The Manager of the Asiatic business of the United States Steel Products Company, Mr. George C. Scott, has been making a thorough investigation of business conditions throughout the Far East. The company has for a long time been operating largely in China, Japan, the Philippines, the Dutch East Indies, etc, from its Shanghai office and a very large business, particularly in steel rails has been developed. Recently orders for 11,500 tons of steel rails were secured by the Company from the Chineese Government. This, however, is only one branch of the Company's activities. As its name implies it handles steel products of every kind. One of its specialties is the triangle wire mesh for reinforced concrete pavements and roadways. Most American cities have realized that reinforced concrete pavements and roadways afford many desirable features, namely: minimum original cost and maintenance, durability, tractive resistance, foothold and sanitary qualities. The triangle wire mesh, it is claimed, has solved the "good roads" problem.

In our last issue we published translations from the Chinese Press of the Hanyehping Loan Agreements and the new Mining Regulations for China. By a regrettable inadvertence credit for these translations was not given to the *Peking Gazette* in which the Agreements and Regulations appeared. We hasten to repair the omission.

THE SOUTH MANCHURIA RAILWAY CO.

WORKSHOPS AT SHAHOKOU

At Shahokou near Dairen the South Manchuria Railway Company has railway workshops, which for completeness of equipment can compare with anything of the kind elsewhere. The company was determined that the question of expense should not prevent the establishment of shops that could not only cope with all the requirements of their own railway, but be capable of undertaking work from outside. With their equipment the workshops entailed an outlay of $2,946,000 U. S. currency. The building material and machinery were purchased from Great Britain and these purchases amounted to nearly $2,000,000 U. S. currency. But as most of the rolling stock of the railway was purchased in America, much of the tool equipment is of American manufacture. The work of construction and equipment was completed in November, 1911. From a report on these workshops by Mr. Albert W. Pontius, American Consul at Dairen we take the following facts:—

GENERAL ARRANGEMENT OF PLANT

The area of the workshops and residential colony is about 400 acres. In the residential section of 200 acres are 695 houses for the staff and laborers, 12 houses for tradesfolk, a hospital, a primary school, a post and telegraph office, 3 small public baths, and a club house. All the houses are lighted by electricity, and the better class homes have hot-water heating systems. The colony is equipped with water supply and drainage systems. According to the latest census it has a population of 2,600 Japanese and 996 Chinese.

The ground space covered by the shop buildings amounts to nearly 11 acres. They are a sufficient distance apart to have good natural lighting and are so grouped as to minimize the distance over which materials and parts must be carried. The shops can repair at the same time 27 locomotives, 36 passenger, and 130 freight cars. The plant includes the following: Locomotive and machine shop; boiler shop; blacksmith shop; foundry; pattern shop and foundry stores; power house; general stores; truck, wheel, and brake shop; wood mill and freight car shop; cabinet, upholstering, and passenger car shop; paint shop; timber storeroom; timber-drying kiln; train lighting equipment shop; testing laboratories; fire station; pumping station; 70-foot turntable; 75-foot traverser; and general office building.

CONSTRUCTION—POWER HOUSE

Most of the buildings are fitted with patent roller shutter metal doors, and in some cases with additional sliding fireproof doors. The locomotive and machine shop, the boiler shop, and the blacksmith shop are steel skeleton structures, with steel roof trusses, inclosed in independent brick walls. The roofs of the locomotive and machine shop and the blacksmith shop are covered with grooved and tongued Oregon pine boards and laid with four thicknesses of tarred felt, cemented with pitch, and nailed down to the roof boards. Finally a coating of pitch was spread over the felt and covered with gravel. Both these buildings are provided with skylights.

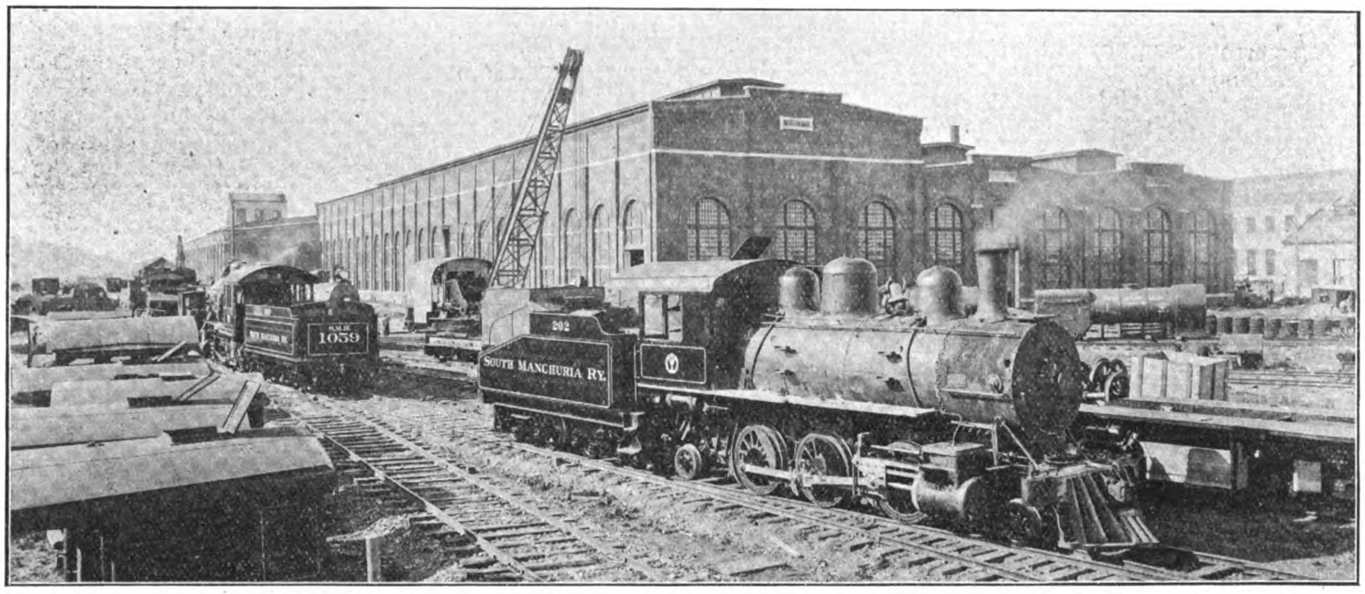
The power house is equipped with three batteries of water-tube boilers. The chimney for the boiler plant is built of steel plates and stands upon a brickwork base. It has a height of 157 feet and a diameter of 9 feet at the top and 16 feet at the base. Coal is received by a hopper and passes then through a valve into the automatic filler, which fills the buckets of the endless chain-bucket conveyor for dumping into any of the six overhead coal bunkers. The coal conveyor is capable of handling about 20 tons per hour. The greatest diameter of the outgoing steam main is 9 inches and that of the incoming return main for water condensation is 4 inches.

HEATING, LIGHTING, AND FIRE PROTECTION SYSTEMS

The "Stanlock" heating system is in use. The steam consumption is estimated at 43,800 pounds per hour and the power for driving the motor fans at 38 kilowatts. A feature of the heating service is the draining of the steam risers by means of special U-shaped water loops, connecting the bottom of each riser with the return pipe. There are 46 radiators, with a radiating surface of 2,645 square feet.

The lighting of the workshops and the yard is accomplished by 60 flame arc lamps of 1,200 candlepower each, 601 tungsten lamps of 100 candlepower each, and 39 tungsten lamps of 25 candlepower each. These lamps are lighted by 25-cycle 100-volt alternating current transformed from the 2,100 volt main, transmitted by the central power house at Dairen.

For fire protection the dry pipe system of the Grinel patent automatic water sprinklers has been installed in the five buildings in which combustible materials or articles are handled or stored. A total of 2,266 sprinkler heads has been installed, the installations being controlled by alternate wet and dry valves. Automatic alarm gongs operate instantaneously with the fusing of the sprinkler heads. There are two sources of water supply. One "Underwriter" steam pump is capable of pumping water at the rate of 1,000 gallons per minute into a cast-iron tank holding 7,500 gallons. This tank is at the top of a steel structure 80 feet above the ground. The fire brigade station is equipped with a light steam fire engine, a hose cart, and six 100-foot lengths of hose.



Exterior View of the South Manchuria Railway Company's Workshops at Shahokou.

THE FAR EASTERN REVIEW

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SHANGHAI AND MANILA, APRIL, 1914

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RAILWAY MANAGEMENT IN CHINA

Divergent opinions concerning the management of the Shanghai-Nanking railway have recently been expressed in the daily press, the difference of opinion being due to an attempt to measure the results of the management of the line from certain statistics obtained from different sources. On the one hand it was maintained that the figures representing the annual deficits of that road were a sure sign that the road had been badly managed, and on the other hand it was argued that the gradual reduction of such losses by the annual increase of gross earnings was a proof equally conclusive that the road had been well managed. While admitting that both sides have some reasons to support their point of view, it is well to mention that in the matter of such a complex enterprise as a railway it is often misleading to judge the management of a line simply by the increase of gross earnings or by the financial deficits during a short period. In the first place, traffic on any reasonably placed railway, the world over, almost always increases from year to year, and hence railway earnings must also increase accordingly, In a country like China, however, where people are accustomed to other ways of transportation, it is but natural that railway traffic is less in the first two or three years than during later periods. The habits of the people, the prosperity of the country, and many other factors, which are beyond the control of the railway management, all combine to affect the traffic and the amount of the receipts of any railway in the country.

Hence it is easy to see that the earnings of a line may gradually or even suddenly increase in spite of an ordinary or even poor management. This is especially true when a short period is considered. Therefore, the figures relating to the steady increase of earnings, while in a way indicating the growing prosperity of the line, do not necessarily prove the efficiency of the management.

On the other hand, neither do the annual deficits of the line prove that the road is badly managed, for there are equally as many factors outside of the control of the management which may lead to such deficits. There is the difference in the location of the line which affects constantly both earnings and expenses, there is the difference in capital cost which in turn calls for differences in annual interest charges, there is the length of the line which affects the economy of operation, and there are a hundred and one other factors which determine the profit or loss of a road. History has shown that two lines, while being equally well managed, may often produce entirely different results. Indeed, if a line is favorably located, it may enjoy seeing traffic flow to it in abundance, so to speak, without any special effort on the part of the railway, in which case money can be made by a "sleeping" management; while on the other hand if a line is badly located and confronted with keen competition, it may find it difficult to make both ends meet in spite of a first-class management. Therefore, it is well to emphasize that to measure the success or failure of the managements of the different lines by simply comparing their receipts or the amounts of profits and losses which appear in their ledgers, often would be doing injustice to the managements. This is especially true, when the figures are not obtained by a uniform method and hence may represent entirely different things.

These facts lead us to say that in comparing the efficiency of the managements of the different railways in China, we must have uniform and more accurate and detailed statistics than what are available, and we must also take the local conditions and the facts of a fairly long period into consideration, before we can hope to do any justice to the railways in our comparison. Under the existing circumstances, where the systems of accounts and statistics of the different railways are all different, and where the system of each line itself is often changed from year to year, all comparisons and criticisms are liable to do more mischief than good. In this connection it is satisfactory to notice that the Ministry of Communications has established a special Commission for the unification of the different systems of railway accounts and statistics,* and has wisely placed this Commission under the supervision of Mr. Yih Kung-chao, the Director-General

*See FAR EASTERN REVIEW, April, 1913.

of Railways, and under the immediate charge of so earnest, progressive, and capable a man as Dr. C. C. Wang, Assistant Director of the Peking-Hankow railway. What is gratifying, too, is the selection as adviser of so able, learned, and experienced an economist and statistician as Dr. H. C. Adams. By looking over the names of the members of the Commission, we notice among them officials interested in accounting and financial matters of the Ministry of Communications and also the chief foreign accountants of all the important railways in China. This immediately leads us to look for good results, for it is only by careful examination and open deliberation as well as all round co-operation, that such an important and difficult problem as the unification of the different established systems may be brought about; and it is only by entrusting the matter in the hands of experts that good results may be obtained. And so far as we know this is the first time in China's railway history that native and foreign experts have been called together to consider and devise rules for solving an important problem in a systematic manner. It is certainly a good example which may help in solving numerous other technical questions.

In spite of the great difficulties which appeared insurmountable at the beginning, we understand that the Commission has just finished its fifth session and has held some fifty meetings. A uniform system of accounts for the use of the lines under construction will soon be presented to the Ministry for enforcement, while the whole programme of the Commission will probably be finished before winter, thus doing work in one year which took other countries at least three years. We look forward with great expectations and hope this quiet but important and lasting piece of constructive work will be allowed to be completed, and that an equally efficient organization and proper men will be found to take care of its enforcement, so that before very long the world may have some up-to-date statistics and other necessary information upon which to judge the railways of China. At present China suffers internally by being unable herself to determine accurately how her railways are doing, and externally her credit is not what it might be owing to the inability of foreign experts to arrive at a correct estimate from the varied methods of accounting in vogue. China stands to reap valuable benefits from a proper application of the recommendations of this commission.

GOVERNOR-GENERAL HARRISON SPEAKS OUT

A "straight talk" by the Governor-General of the Philippines to the business community at Manila, has considerably cleared the air and promoted a distinctly better feeling in business circles. The occasion was an informal "smoker" at Malacanan palace at which practically the whole of the business community was represented. After assuring his hearers that he was with them in anything and everything Mr. Harrison went on to say:—

"I am an American and there is nothing in the world that I am so proud of as this fact. Every drop of blood in me is American, and gentlemen, I want to assure you that in everything that may happen I am one of you.

"I do not intend to make a political speech tonight and furthermore the political status of the Philippine islands cannot be settled here. The congress of the United States is the supreme authority to settle this question and I sincerely hope with you that the status and the limitations of the Philippine question, which is a world-wide question, will soon be definitely settled. The former administration has failed to do so and then, as to-day, you businessmen suffered from the same uncertainty as you do now. The executive has no power to alter this condition. He can only advise you to be hopeful and cheerful as to the future.

"Conditions in the islands are excellent, agriculture is in a state of prosperity such as it has never enjoyed before, and agriculture is the basis of all prosperity.

"There is another point about the business depression. It is not confined to the Philippine islands alone, it is world-wide. I urge you to look beyond the limits of the Philippines, to find the reasons for the present tightness in the money market. The United States is just recovering from a financial stringency. Germany had a year of bad business, followed by France's slump in commercial prosperity. A foreign minister about a year ago told me that within a few months from the time I spoke to him $500,000,000 worth of American securities would be unloaded to meet the eventualities that might arise out of the Balkan situation. Just think of it, $500,000,000 which the American market had to absorb. So you can readily see that when you look beyond the Philippines you will understand present conditions.

"As a matter of fact the local situation has been better than could reasonably be expected under present conditions. After all, credits depend largely on sentiment and I should advise you to look at things from the cheerful side. As I said before, I am with you in anything that I or my colleagues on the commission can do to further your interests. I can assure you that we all desire your utmost prosperity.

"I am now here six months. The law compels the chief executive to co-operate with the legislature and for that reason I found such an amount of work before me that I had to forsake practically all social and recreative activities. It was not that I did not want to meet you before; it was a physical impossibility. You are many and I am only one, and could I sub divide myself into ten persons I could not grant all the interviews that are requested of me.

"I assure you that I am profoundly grateful to have had this opportunity of meeting you all to-night and I hope that in the future misunderstandings between us will be barred. In the east, it seems everything is rumor. Something starts as a rumor, lives as a rumor, and dies as a rumor without having had any foundation in fact. Be cheerful, and eventually all will be well."

This straightforward address was extremely well received by the guests. Suggestions had been made covertly that the Governor-General was quite out of sympathy with the legitimate aspirations of the American community. That such a charge was absolutely baseless was known to all unprejudiced people who had had an opportunity of learning Mr. Harrison's views, but there were many to whom such an opportunity had not offered. It is a plain statement of truth that the executive has no power to determine the political status of the Philippine Islands. Congress alone can supply the solution of this problem, though it may be assumed that the reports and recommendations of the executive must needs carry weight. That being so it was reassuring for the business community to learn that the Governor-General was in entire sympathy with them and had every desire for their prosperity. This may be taken to mean that he will recommend that whatever steps are taken in regard to the Philippines the rights of Americans in the Islands should be effectively safeguarded. The increased confidence Mr. Harrison's speech has inspired should go far towards restoring a normal condition of affairs in the local business arena.

THE NORTH CHINA OILFIELDS

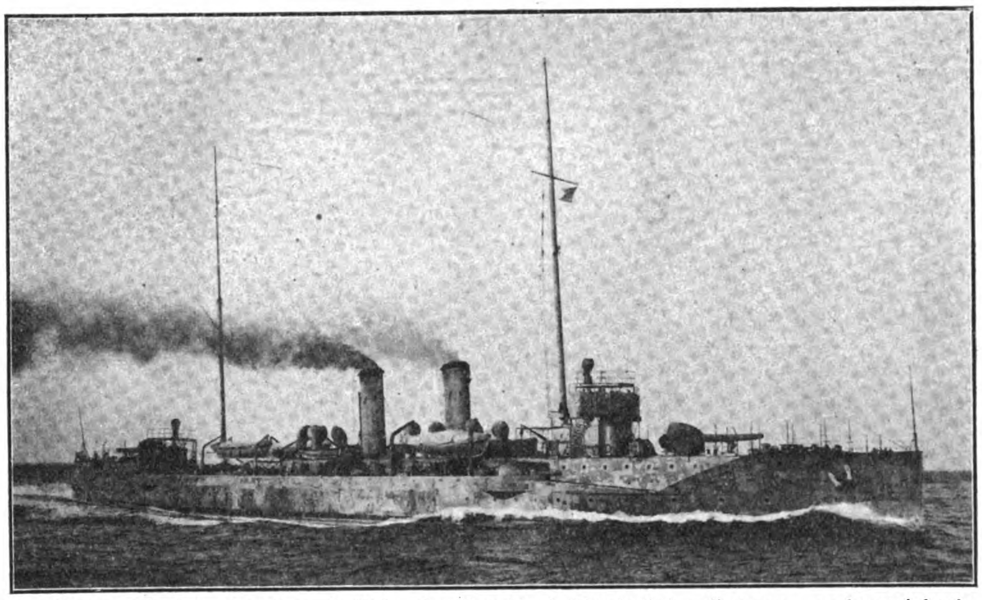
In certain quarters a tendency has been shown to doubt whether the Standard Oil Corporation of New York intended seriously to carry out the agreement made recently with the Chinese Government for the exploitation of the North China oilfields. An amply sufficient answer has been given by the arrival in Shanghai early in April of a staff of engineers and drillers. These men will proceed to the oil fields directly the preliminary reports of the experts who are investigating the oil deposits are to hand. It will be remembered that by the agreement the oilfields of Shensi and those near Jehol were to be investigated in the first instance. The experts proceeded to Jehol immediately the Agreement was signed. After completing their investigations in this locality they will visit the Shensi fields.

Another indication that the Standard Oil Company was thoroughly in earnest is afforded by the despatch of a special steamer with 1800 tons of drilling machinery to North China. The withdrawal of so many expert geologists and workmen from other work and the prompt provision of necessary machinery is a satisfactory proof that as far as the Company is concerned no time is to be lost in proving the value and extent of the oil deposits. If the prospects warrant it, it may be confidently assumed that equal celerity will be shown in starting active operations, and that China will have provided for her a new and increasingly valuable source of revenue. It is sincerely to be hoped that the investigations prove satisfactory, as the success of the co-operation of the Chinese Government with a foreign company with expert knowledge, wide experience and practically unlimited capital, would prove the forerunner of other arrangements of a similar kind. This is the one sane and safe method by which China can overcome her financial difficulties and develop the resources which would otherwise continue to be untouched. The riches that are hidden in the bosom of China

are hers, but hers as a trustee for the rest of the world. She is entitled to profit by their exploitation, but humanity in general has the right to benefit by their use.

THE SALT REVENUE

While the estimate of salt collections as set down in the revised budget is abnormally high in view of the conditions which have been obtaining in China of late, it must be gratifying, to the holders of bonds secured upon the salt revenue to know that a great improvement has been shown in the collections. Between May 21 and December 31, 1913, the total deposited in the banks representing the Reorganisation Loan bondholders was Mexican $14,150,000, while in the first three months of this year the sum deposited was $12,880,000, and the Ministry of Finance estimates that the end of the year will see fully $55,000,000 in the banks from this source if some unforseen difficulties do not arise. To serve all the loans secured upon the salt revenue the sum of $16,250,000 will be needed in 1914, leaving a balance which will be utilised as part security for the loan of £15,000,000 now being sought by the Central Government. The reforms which Sir Richard Dane has suggested will be put into thorough effect if Mr. Chang-hu, the Head of the Central Salt Administration, can have his way. Already he has secured a striking improvement in collections, but he has a difficult battle to fight with the vested interests. Sir Richard Dane is personally hopeful that the Government will be able effectively to follow his advice, and if that can be done the question of security for the talked of loan need cause no worry to the bankers. The representatives of the vested interests have, however, held meetings to protest against the changes proposed in the collection of the salt dues and in all probability if the matter becomes acute a conference will be held to adjust the differences.



The Chinese Cruiser *Fei-Hung*, built by the New York Shipbuilding Company, on her trial trip.

POLITICAL RAILWAY MAP OF CHINA

We have had prepared a political railway map of China in five colours. This map shows all the railways in operation, under construction, contracted for, and projected. The use of colours to denote the political complexion of the lines makes plain at a glance the policy of the different Powers in relation to China. These maps can be purchased for fifty Mexican cents per copy at most booksellers or from the head office of the FAR EASTERN REVIEW, 5 Jinkee Road, Shanghai.

COLONIAL EXHIBITION AT SEMARANG

The Netherlands Consulate-General has sent us a prospectus of the Colonial Exhibition which is to open at Semarang, Java, on August 13, 1914 and close on November 15, 1914. The prospectus is attractively got up and supplies all information likely to be useful to intending visitors. There will be six sections of the Exhibition:—1. Colonial Government. 2. Agriculture and Horticulture. 3. Native Industry, Mining, Forestry, Hunting and Fishing. 4. Foreign Industry. 5. Commerce. 6. Means of Communication.

THE CHINA MERCHANTS' STEAM NAVIGATION COMPANY

GOVERNMENT VETOES NEW ISSUE OF SHARES

In the March issue of the FAR EASTERN REVIEW it was stated that the announcement had been made that the preliminary payment on account of the Hanyehping Loan arranged with Japanese financiers had been used to redeem scrip of the shares in the China Merchants' Steam Navigation Company owned by Sheng Hsuan-huai, and further that it was intended to dispose of these shares to Japanese interests. These reports naturally attracted the attention of the Government and an announcement was made by the Ministry of Communications in the following terms:—

On the 15th day of the 2nd month, the China Merchants' Steamship Navigation Company, Shanghai, held a special meeting. This Ministry then telegraphed to Intendent Yang, instructing him to attend and supervise the meeting, and ordered the said Company to report the proceedings of the meeting to the Ministry. Afterwards a petition was received to the effect that the meeting decided that the Company should be divided into two, namely, the Navigation and the Property Companies. The old share scrip shall be exchanged into two kinds of new scrip. For the Navigation Company new scrip to the amount of Tls. 8,000,000 will be issued. The holder of the old scrip of Tls. 100 shall be given for exchange Tls. 200 worth of new scrip. This new scrip shall be called "share of the China Merchants' Steam Navigation Company, Limited." With regard to those which have no connection with the navigation enterprise, new scrip of $4,000,000 will be issued. For every old share of $100, an additional new scrip of $100 will be given. This new scrip shall be called, "shares of the Company for the Accumulated Properties in the Ports, etc.

It must be noted that in art. 6 of the regulations of the said Company it is provided that "Should there be sale, transfer or exchange of the properties of this Company, the sanction of the Ministry should first be obtained, before any transaction is made," and this rule has hitherto been kept. With regard to the present suggestion of the said Company to effect a change in the shares, and to divide the Company into two, this is a matter of great consequence. It has not yet been ascertained what is the real worth of the properties of the said Company, whether the fixed value be a true one, or whether the Company has to meet any obligation of debts to the public. Moreover it must be considered whether it is right to divide the enterprise undertaken by the said Company into two. Therefore all the above points have to be investigated, so that care may be exercised in all its transactions.

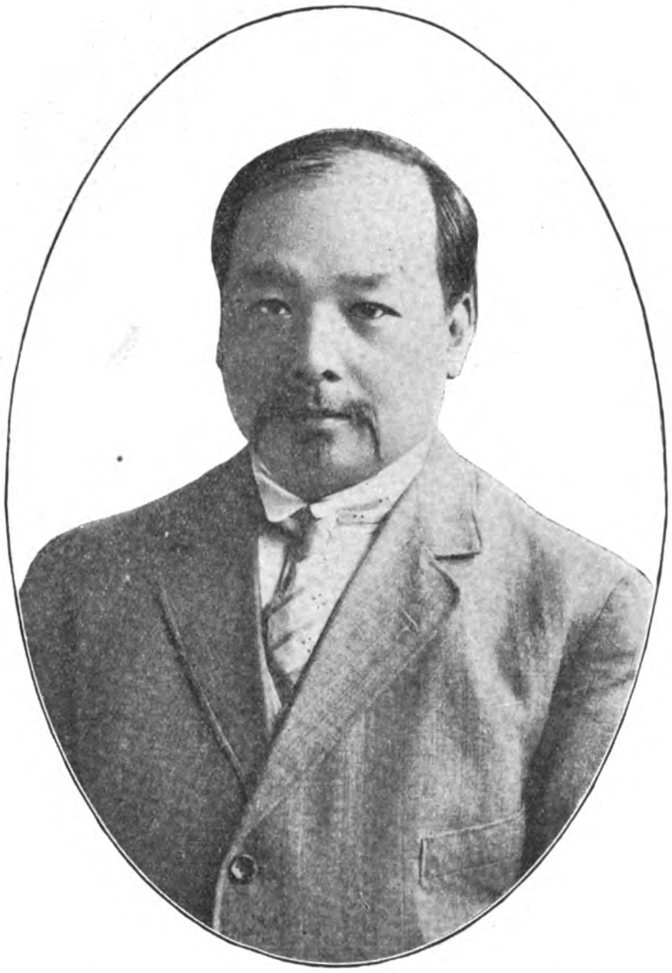
Therefore this Ministry is now going to institute a joint investigation with the Ministry of Agriculture and Commerce. Before the decision of these two Ministries is made, no steps taken by the said Company will be considered as valid. Therefore before the sanction of our Ministries is given, should the said Company issue new scrip or should the said new scrip be sold or mortgaged to others, or be confiscated by others, they shall have no legal effect whether they be in the hands of Chinese or foreign subjects. Besides telegraphing to the above effect to the said Company, this notification is hereby issued for general information.

This notification was advertised in the foreign and vernacular press throughout China early in April. It is alleged that the proposed division of the Company into a navigation company and a property company was an astute move on the part of Sheng Hsuan-huai to evade responsibility to the Government if he disposed of his shares to foreigners. Another theory has been advanced, however. It is believed in some quarters that Sheng never had any intention of disposing of his shares to foreigners, but simply sought to alarm the Government so that they would buy out his interest.

PEKING POLITICS

The battle royal which has been proceeding in the Presidential Palace between the military and the civil leaders to determine the fitness of those who claim the right to control the purse strings of China ends in a compromise. The determined set made by the military to remove the Chief Secretary of the President, Mr. Liang Shih-yi, from power was the most threatening onslaught that the all-powerful Cantonese has so far had to meet, and naturally enough a wide circle of officials evinced a keen personal concern in the affair, since the overthrow of Mr. Liang Shih-yi would mean the removal from office of the innumerables who depend upon his patronage. Foreigners, too, were closely interested, since the Chief Secretary is the possessor of the final voice in the majority of the affairs in which foreigners are concerned, and rightly or wrongly they entertain the idea that he does not always view with unprejudiced eyes the various matters which they are anxious to see consummated, and which he feels constrained to regard from a purely Chinese standpoint.

Mr. Hsu Hsih-chang, Secretary of State.



Mr. Liang Shih-yi, Chief Secretary to President Yuan Shih-kai.

While the military party felt that they should dominate in the councils of the State, and at the same time should possess undivided control of the finance producing departments of the country, they were unable to carry sufficient guns to capture the positions in which the Chief Secretary has long been entrenched, despite the fact that the military consider themselves to be the main-stay of the President, and, in addition, had a large section of the press on their side. President Yuan Shih-kai, however, owes so much to Mr. Liang Shih-yi for valuable services in times of crises in the past that he could not willingly consent to his removal from office, and as the President's loyalty to those who have been near to him for lengthy periods is well-known it is inconceivable that Mr. Liang Shih-yi can be removed unless the President is in some way forced to consent. And if he did consent it is not likely that the military party could produce for the President any man with a tithe of the ability that his old Chief Secretary possesses. Whatever may be the character of the charges levelled or substained against Mr. Liang Shih-yi it is generally acknowledged that he is a Chinese of great capability and daring; the type of ingenious man whom the President must have near him, and one who has a wide grasp of the affairs of the country. We do not propose to examine in any way the merits or demerits of the allegations made against Mr. Liang, but mention his survival in the campaign against him as an important factor in the game of political chess which has been proceeding of late in Peking.

The compromise which has been arrived at as a result of the failure of Mr. Liang Shih-yi's enemies to unseat him in the service of the President brings into public life again an ex-Grand Councillor, Mr. Hsu Hsih-chang, who will take the place of the Premier, under the Chinese title of Kuo-wu-ching, or, literally, Secretary of State. Mr. Hsu comes forward as a peacemaker between the conflicting groups, and his knowledge of the old style combined with his appreciation of the new will do much to restore quietude within the Palace confines. The advent of Mr. Hsu may, too, solve difficulties other than these created by the factions in the Palace. With his acceptance of power may begin the organised attempt at government for which the country and the world have been patiently waiting ever since the revolution. A Chinese paper recently remarked that for the past two years "the country has been in the storm and the people have been in the wilderness," and while these calamities have been ascribed in the past to the political ambitions and machinations of the so-called inexperienced students of political economy, they should now be removed since the experienced men of the Ching Dynasty have again come back to power.

With Mr. Hsu Hsih-chang it is fairly certain that Mr. Liang Shih-yi will work eventually in affable concord, though an attempt was made to swallow up the Presidential Secretariat in a newly-created body known as the Cheng-shih-tang, or "Government Council," an organisation very similar to the Grand Secretariat of the Ching Dynasty. Mr. Liang steadfastly opposed such a move, however, and succeeded in frustrating the attempt to limit his influence in this manner. He remains outside the pale of the Cheng-shih-tang, and is still responsible only to the President, dominating, as before, the Ministry of Communications, and other Boards. His enemies will naturally continue to work for a

curtailment of his energies, but those who know China and the Chinese will find it difficult to believe that Mr. Liang's long experience of the intricate game of Chinese politics will fail him in this important crisis.

As the Secretary of State Mr. Hsu Hsih-chang, will, however, bring another change in the Cabinet, but there is a likelihood that the new officials will only be appointed upon acceptance by Mr. Liang Shih-yi, in which fact only will be the solution of the present difficulties, short, of course, of the retirement of Mr. Liang himself. Mr. Hsu has many points in his favor when the circumstances of the moment are considered. He is an old henchman of the President, is a Hanlin—one of the flower of the Chinese literati—and, in his early associations with President Yuan Shih-kai in the creation of the modern drilled army, was superior to the military officers who now hold the highest ranks in the army, a point of great importance when the Chinese reverence for their masters is remembered. Likewise he is about the only old official whom the President could call to his side who can command the respect of other old officials whose services will be enlisted. Thus he will be in the unique position of being able to obtain respect and a hearing from both the military and official leaders. Judged by the standards of the old regime Mr. Hsu Hsih-chang is a capable man. He has had the opportunity of obtaining wide experience in administration. He has occupied the first position in almost every Board in the Ching Dynasty, as well as having been one of the Grand Councillors, later becoming the Tai-pao, or "Protector of the Emperor's person," a position ranking somewhat higher than the office known as the "Guardian of the Emperor." To the Young China party, however, Mr. Hsu Hsih-chang is the personification of what is reactionary, and they believe that he will bring back into power the out-of-date ideas which they imagined the revolution had thoroughly extirpated. The future will show, of course, what type of official is better for the immediate good of China. It has been declared that the Young China party has been tried and found wanting, and now it is the untramelled turn of the old to show that after all they alone know how to govern. The great masses of the Chinese people will be quite content to have the old return to power if peace is given the country and trade and commerce are permitted uninterrupted freedom, and foreigners will entertain no feelings at all in the matter so long as they are afforded facilities to develop the enterprises which bring them to China.

Mr. Sun Pao-chi, Acting Premier and Minister of Foreign Affairs.

Whether the "constitutionalists" will be satisfied with the institutions which are to represent popular government is a moot point. The resurrection of the old Grand Secretariat system will make them suspicious, and any constitution devised by the Tsan-cheng-yuan, which is to be created to make the final recommendation for a permanent constitution, is certain to incur their distrust. Parliament will be, too, a farce in their eyes, by virtue of the fact that it will be entirely dominated by the President and the high officials. However it is provided that a Lieh-sa-yuan, or, literally, "Legislative Department" shall be formed by the election of not more than one hundred members, while a sort of upper chamber will be formed by the members of the present Administrative Conference under the title of the Ko-wen-yuan, or, literally, "Advisory Department." With these organisations the President is convinced that the government of the country can be carried on in a highly satisfactory manner, and that the results will soon persuade the critics among his own nationals that his judgment of the needs of the time was correct.

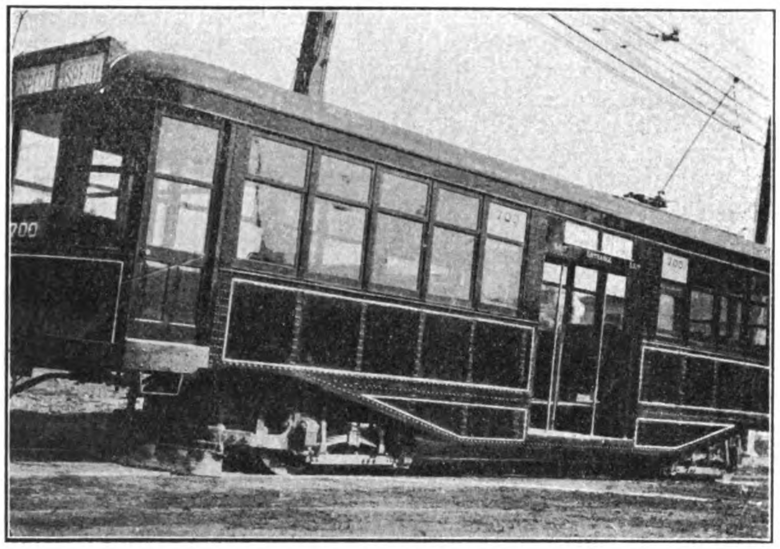
The one thing certain is that China is now being put to the test which is, in the eyes of the watching world, likely to be final. If the President fails within a reasonable time to restore the finances of the country, to establish peace, to obtain security for industrial, commercial and agricultural development, and, in short, to inaugurate a period of general progress, it is likely that the foreign nations will be forced to consider the question of taking control of the affairs of China in order to protect their own interests and the interests of the Chinese people. All supporters of the President feel convinced that he will now be able to demonstrate that, given the opportunity, he is capable of placing China on her feet.

General Tuan Chi-jui, Minister for War.

NEW STREET CARS FOR MANILA

After two years successful operation in New York and other cities in the United States and Canada the "Pay-as-you-enter" surface street car has at last reached the Orient. The Manila Electric Railroad and Light Company announce that they shortly intend placing six of the cars in service on their Santa Ana-Rotunda line. The cars are of the centre entrance type, which owing to its many advantages over other types of cars in use has gained much popularity.

The cars are being constructed from designs by Francis J. Tew in the shops of the Company in Manila and are of all steel construction, the only woodwork being in the floors, window frames and seats. The principal feature of these cars is embodied in its name although they are also known as the "stepless" or "low level" car. The car resembles the usual type of enclosed car, except that it has only one enclosed controller platform for the motorman and the sinking of the flooring in the center of the car where there is a large opening. This center opening is divided into three sections, the middle one for all boarding passengers and the other two for alighting passengers. The front end is for first class and the rear for second class passengers. Sliding doors controlled by a lever in the hands of the conductor safeguard passengers. One step and passengers are on the floor of the car and in a position facing them stands the conductor by two fare boxes. Passengers before proceeding to their seats deposit the fare in the boxes.



Manila's New Street Cars.

Manila's New Street Cars showing entrance and exit.

The cars are larger and wider than usual and in addition to giving room for wider seats and aisles gives seating capacity to 54 adults comfortably. They are fitted with 50 B. H. P. Motors. The seats are crosswise in the car with a centre aisle and each seat accommodates two adults. There are large drop windows at the sides which are operated by raising the window a few inches, lifting the window sill, then lowering the window and replacing the sill. The rear end of the car in rounded off and makes an observation platform.

The construction of the cars is well advanced and one, which has already been completed, has been successfully run over the lines of the company. The cost of the cars fully equipped is approximately P. 11,000. each.

The South Manchuria Railway Company has obtained the consent of the Chinese Government to carry out the dredging of the River Yalu across the Bar at Wutaokou this year. The work will be commenced very shortly, with four Priestman grab-dredgers.

IMPROVEMENTS AT ZAMBOANGA.

The city of Zamboanga, according to the *Mindanao Herald*, will shortly be bountifully supplied with pure water and electric light and power. Our contemporary, under date March 28, says that a scheme is being worked by the Department Engineer, and the studies that are being made are for a combined water system and electric light plant. The reason for the combination is that the waterworks will probably not be a paying proposition for a number of years while the electric plant, with its cheap power cost, will pay well, thereby taking care of the waterworks deficit.

Mr. H. F. Cameron, the Department Engineer, has mapped out a general plan for the proposition, and Mr. C. G. Yankey, formerly assistant engineer of the province of Nueva Ecija, is now in the field working out the details. Mr. Yankey has the reputation of being an excellent field man and practical engineer.

It is understood that the former plans for the waterworks, upon which work had commenced by Contractor S. A. Vicroy, have been abandoned because of the excessive cost of maintenance, the same being estimated at about P. 28,000 over and above the estimated revenue from sales of water. This sum represents about all the annual revenues of the city available for public works so it was imperative that a more economical method should be worked out, hence the combination of the hydro-electric plant with the waterworks. It is believed that the cost of the combined propositions will come well within the city's authorized bond issue.

The general plans for the new project over which the engineering lines have been run and found feasible are as follow:

Water is taken from the Tumaga River about fourteen kilometers (8½ miles) from the department capitol and brought down 5½ kilometers on a 0.2 per cent. grade to a point 8½ kilometers from Zamboanga where the elevation at the end of the flume is 135 meters (445 feet) above mean lower low water. Here the water is taken from the end of the flume for waterworks and carried by a small pipe running freely twenty-four hours a day into a reservoir that will set on about the 100-meter elevation above Zamboanga, instead of the 46-meter elevation provided by the old plans. This will give a static pressure of about 130 pounds the square inch in Zamboanga, and a sufficient hydrant pressure for fire so that, like Cebu, no fire engines will be necessary.

The remainder of the water in the bench flume will be dropped in on a steel penstock about 48.7 meters (160 feet) to a Pelton, or other, waterwheel which will operate the electric generating machines. A 8½ kilometer transmission line will deliver the power in Zamboanga where about 100 kilowatts of electricity will be available for use.

The flow of the Tumaga River during this the dryest season known in years is twenty-five second feet, and only half of this flow is needed for the present project. At a small extra cost the balance of the water can be used for extra power or irrigation.

ROYAL STATE RAILWAYS OF SIAM

Administration Report for 1912-13.

The sixteenth administration report on the traffic of the Royal State railways in Siam for the Siamese year 131 (1912-13) was presented to H. E. Chow Phya Wongsa Nuprabhadh, Minister of Communications, by Mr. L. Weiler, Director-General of Railways.

The following items are taken from the report:—

Length of Line

On 15th November, 1912, a further section of the Northern line Meh Puak—Pak Pan was opened to traffic, bringing the total length open up to 962.1 km. viz:—

a. Broad gauge.	
Bangkok—Korat	264.1 Km.
Ban Phaji—Pak Pan	447.8 „
Ban Dara—Sawaskaloke	28.9 „
Bangkok—Petriu	63.4 „
Branch to Menam River at Bangkok	6.5 „
	810.7 „
b. Narrow gauge.	
Bangkok Noi—Petchaburi	151.4 „
Total ..	962.1 „

Capital

The Capital outlay from the commencement on all open lines amounted at the close of the year to 62,498,546 Ticals as specified below:—

a. Broad Gauge.	
Bangkok—Korat	17,673,189
Ban Phaji—Den Chai	28,817,492
Den Chai—Pak Pan (accounts not yet closed)	144,000
Ban Dara—Sawaskaloke	816,582
Bangkok—Petriu	3,424,333
Branch to Menam River	614,150
Extensions and improvements ..	2,719,501
Various surveys	48,125
Total ..	54,257,372
b. Narrow Gauge.	
Bangkok Noi—Petchaburi	8,115,878
Extensions and improvements ..	125,296
Total ..	8,241,174
Grand Total ..	62,498,546

Percentage of expenditure to gross receipts.

	Year 2455	Year 2454	Difference
Maintenance of Way and Works	11.23	11.38	—0.15
Locomotive Department	15.23	14.85	+0.38
Traffic	9.84	9.22	+0.62
General	0.89	0.81	+0.08
Total ..	37.19	36.26	+0.93

The feature of the year under report is a general decrease of the traffic for passengers as well as goods due to the poor paddy crop of the season.

Altogether there were carried 3,114,600 passengers against 3,132,903 in the preceding year and the total goods traffic excluding Railway construction materials and live-stock amounted to 277,296 tons against 286,926 in the year 2454.

The transport of live-stock decreased from 123,630 heads in 2454 to 91,702 heads in 2455. The paddy carried last year amounted to 96,782 tons against 105,777 tons in 2454 and 124,991 in 2453.

Financial Results

The following are the principal items under this head:—

	Year 2455 Ticals.	Year 2454 Ticals.	Increase Ticals.	Decrease Ticals.	Per-cent.
Gross receipts	4,368,436	4,623,683	....	255,247	5.52
Working expenses	1,624,614	1,676,779	....	52,165	3.11
Net earnings	2,743,822	2,946,904	....	203,082	6.89
Contribution to Renovation Fund ..	321,443	327,411	....	5,968	1.82
Remaining Net Profit	2,422,379	2,619,493	....	197,114	7.52
Or percentage on Capital account ..	3,89	4,26	....	....	0.37

Revenue

Receipts from ordinary Passenger traffic show a decrease of 71,689 Ticals. Details are as follows:—

Receipts from	2455 No.	2455 Amount	2454 No.	2454 Amount	Increase No.	Increase Amount	Decrease No.	Decrease Amount
I Class	9,113	44,896	9,518	49,796	......	......	405	4,900
II „	41,479	111,822	37,435	101,682	4,044	10,140	......	......
III „	3,064,008	2,582,837	3,085,950	2,659,766	......	......	21,042	76,929
Total ..	3,114,600	2,739,555	3,132,903	2,811,244	4,044	10,140	22,347	81,829

Passenger Traffic in Section Order

Section	Year 2455 Ticals	Year 2454 Ticals	Increase Ticals	Decrease Ticals	Receipts Ticals per km. open line during 2455
1. Bangkok—Ban Phaji	722,091	777,834	....	55,743	8,023
2. Ban Phaji—Korat	352,003	332,041	19,962	....	2,023
3. Ban Phaji—Paknampoh...	376,598	413,744	....	37,146	2,353
4. Paknampoh—Pitsanuloke	190,198	220,913	....	30,715	1,378
5. Pitsanuloke—Ban Dara	35,263	39,777	....	3,514	511
6. Ban Dara—Utaradit	43,715	47,608	....	3,893	1,619
7. Utaradit—Pak Pan...	62,506	60,496	2,010	....	1,157
8. Ban Dara—Sawankaloke	26,159	29,330	....	3,171	902
9. Bangkok—Petriu	228,758	217,725	11,033	....	3,631
10. Bangkok Noi—Petchaburi	702,264	671,776	30,488	....	4,650
Total ...	2,739,555	2,811,244	....	71,689	2,748 (2,978)

Average fare paid per passenger was Ticals 0.88 (0.90) and the average distance travelled per passenger 43.28 km. (44.61).

Average receipt per passenger per km. amounted to 2.03 stangs (2.01).

Other coaching traffic

	2455 Ticals	2454 Ticals	Increase Ticals	Decrease Ticals
Luggage	21,585	18,393	3,192	....
Special trains and sundries	9,627	164,112	....	154,485
Total ...	31,212	182,505	....	151,293

Goods and Live-Stock

There was a falling off both in the goods traffic and in the conveyance of head of live-stock in 131 (1912-13) as compared with the previous year. In 131 the tonnage of goods forwarded was 293,787 as against 298,238 and head of live-stock 91,702 as against 123,630. The financial return fell from Ticals 1,539,859 in 1911-12 to Ticals 1,504,937. The average receipt per ton was Ticals 5.01 as compared with Ticals 5.05 in the previous year, and the distance goods were carried averaged 179,22 Km.

Rolling-Stock

The rolling stock of the broad gauge system was increased by

1 3 axled saloon car for His Majesty the King
20 goods wagons

and decreased by 2 locomotives which have been condemned after having been is service since the commencement of construction of the railways 20 years ago and comprises now:

57 locomotives
209 passenger cars and luggage vans
808 goods wagons

The number of goods wagons does not include 54 open wagons with wooden frames and buffers which are only used for construction purposes.

The rolling stock of the Petchaburi line (1 m. gauge) was increased by:

2 locomotives and
10 passenger cars,

bringing the total to:
10 locomotives
52 passenger cars and luggage vans
109 goods cars.

Railway Staff

The total number in railway employ at the close of the year under report was 2,785 against 2,710 of the previous year.

They consist of:—

703	Officials	(640)
65	Watchmen	(57)
315	Workmen	(298)
1,702	Coolies	(1,715)
Total 2,785		(2,710)

Total Receipts and Expenditure

Statement showing the Total Receipts and Expenditure for the Year 131 (1912—1913)

Receipts	Standard Gauge T	S	Meter Gauge T	S	Total T	S
Coaching traffic	2,064,424	67	706,343	33	2,770,768	—
Goods traffic	1,246,483	23	133,351	47	1,379,834	70
Live-stock	128,037	20	8,967	—	137,004	20
miscellaneous	70,382	96	10,446	77	80,829	73
Total receipts	3,509,328	06	850,108	57	4,368,436	63
„ expenditure	1,333,104	65	291,509	50	1,624,614	15
Net earnings	2,176,223	41	567,599	07	2,7438,22	48

Expenditure	Standard Gauge T	S	Meter Gauge T	S	Total T	S
Personal emoluments	598,931	62	126,764	62	725,696	24
General charges	62,360	40	12,348	02	74,708	42
Expenses for maintenance of ways and works	304,057	48	54,586	10	358,643	58
Expenses for fuel, pumps and rolling stock	338,885	65	95,395	41	434,281	06
Expenses for new works which are not added to Capital Account	28,869	50	2,415	35	31,284	85
Total expenditure	1,333,104	65	291,509	50	1,624,614	15
out of which	2,294,019	37	have been remitted to the Treasury for the year under report.			
	449,803	11	remain on the 31st March due to Treasury.			
Total as above	2,743,822	48				

Improvements and Extensions on the Lines open to Traffic

I. Charged to Capital Account.

	A. Broad Gauge	T.	S.	T.	S.
1	Remodelling and extension of Bangkok Terminus (continued)	11,021	12		
2	Completion of installation of vacuum brakes on passenger trains	3,384	73		
3	Purchase of a new Royal Saloon car with 3 axles	39,013	88		
4	Establishment of a 3rd stone crusher at Chong Kae (to be continued)	19,969	30		
	Total	73,389	03		
	Less depreciation				
1	from earnings of stone crusher at Chong Kae Tcs. 7,413.59				
2	from earnings of sawyard Nong Nam Khoon „ 8,000.00	15,413	59		
	Balance to be transferred to Capital Account			57,975	44
	B. Narrow Gauge (Petchaburi line)				
1	Stretching of a 2nd telegraph wire from Bangkok Noi to Petchaburi	9,069	17		
2	Construction of cross-overs at Ban Chimbhalee and Klong Maha Swasdee	5,828	91		
3	Purchase of 10 passenger carriages	31,687	10		
4	Construction of a paddy siding at Phrong Madnah	1,650	16		
5	Purchase of 2 locomotives	77,060	91		
	Total			125,296	25

II. Charged to Working Expenses

	A. Broad Gauge	T.	S.	T.	S.
1	Bxtension station yard Pak Djong (to be continued)	5,653	55		
2	Electric light installation of Royal Saloon cars,	5,667	99		
3	Additional telegraph wires	5,408	77		
4	Additional water crane at Tapanhin	2,478	60		
5	Construction of a siding at Ban Dan	1,316	33		
6	Construction of paddy sidings at Nong Quai and at Ban Nong Booa	5,241	18		
7	Electric light installation of official quarters at Makasan	1,090	80		
8	Quarters for a telegraph lineman at Paknampoh (to be continued)	1,081	28		
	Total			28,028	50
	B. Narrow Gauge (Petchaburi line)				
	Electric light installation of Royal Saloon car	2,415	35		

In addition to the above mentioned works 15,019 Ticals were spent out of the Renovation Fund for replacing timber bridges by more solid constructions, it being the policy of the Department to do gradually away with the timber bridges. They were chosen at the time of construction for the sake of cheapness and quickness. They have proved alright so far, but the elder ones 10 to 15 years old, have given lately trouble in keeping same in good condition. Besides there are in the dry season always some cases of such bridges being set on fire either by the engine itself or by jungle fire, thereby causing inconvenience to the train service.

History of the Line from Meh Puak (km. 437.6) to Den Chai (km. 444.0)

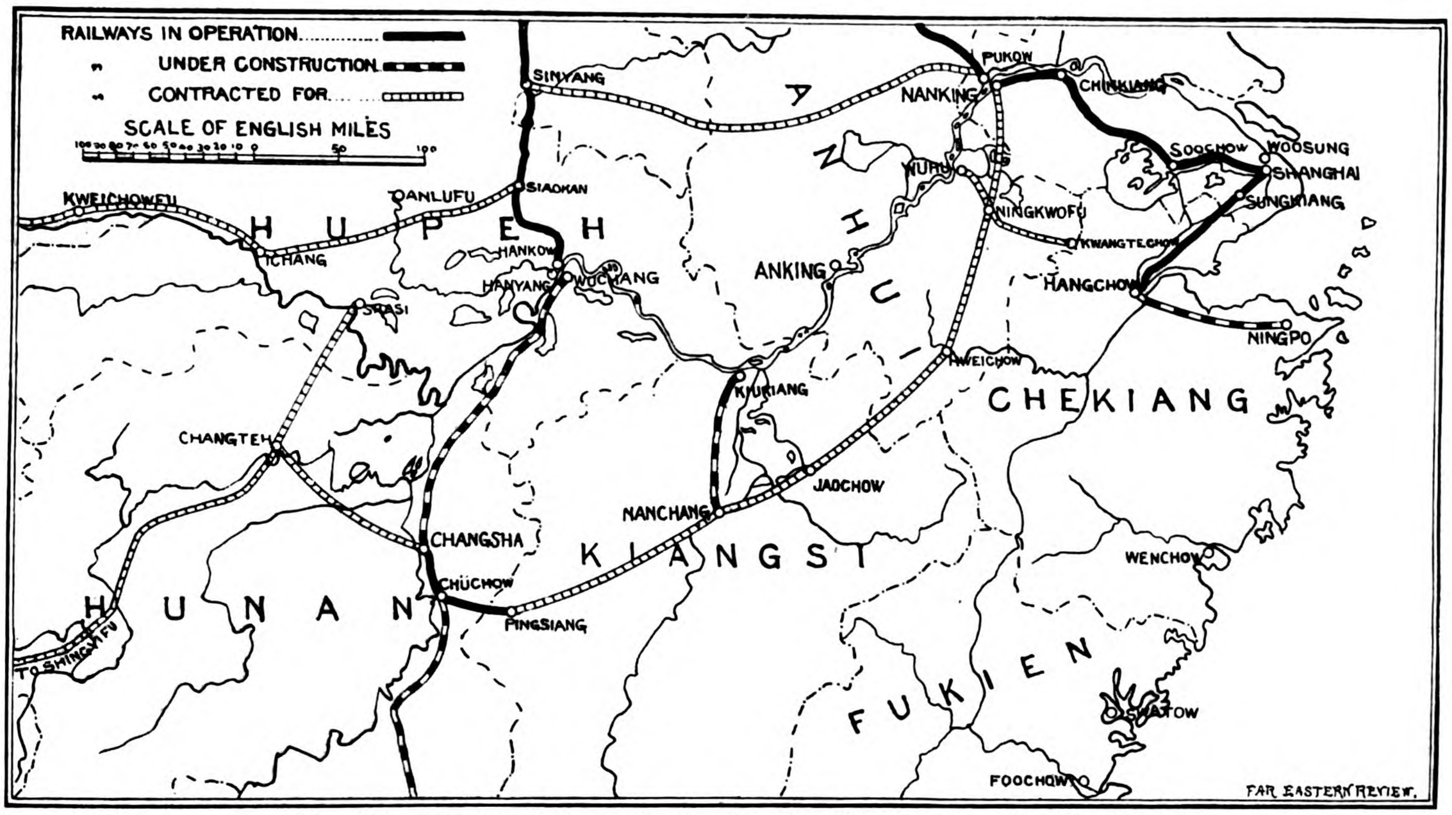
The line was opened to traffic on 15th November. The cost amounting to 246,851 ticals against 265,000 ticals sanctioned have been transferred to capital account and are herewith specified.

Particulars	Total cost T.	Cost per km. T.
Acquisition of Land		
Earthworks:		
Tracing and surveying	675	105
Clearing	1,289	201
Earth and rockworks	72,080	11,263
Fencing (Fencing of Stations excluded)		
Level crossings		
Culverts and Bridges:		
Culverts and masonry of bridges of less than 10 m. span	17,736	2,771
Timber bridges		
Steel bridges (including piers and abutments)	7,799	1,219
Tunnels		
Permanent Way:		
Rails, fastenings & switches	47,011	7,345
Ballast	8,051	1,258
Sleepers	9,754	1,524
Transport & laying of P. W.	27,085	4,232
Maintenance		
Telegraph, Signals, Line Marks and Permanent Way Huts	2,230	348
Stations:		
Buildings	11,772	1,839
Turntables, etc.	6,050	945
Platforms, roads, etc.	500	78
Special arrangements for H. M. the King, etc.		
Workshops:		
Buildings		
Outfitting with tools and machinery		
Extraordinary Works	2,292	358
Rolling Stock	21,897	3,421
Administration:		
Salaries and allowances, including transport facilities	10,049	1,570
Office expenses	476	74
Inventory for Construction	81	13
General Expenses:		
Sanitary service	16	3
Festivities		
Sundries and unforeseen		
Total	246,851	38,570

The Chartered Bank of India, Australia and China have acquired a site in Legation Street, Peking, opposite the American Legation for the purpose of building suitable premises for a new agency.

THE NANKING-NANCHANG-PINGSIANG LINE

The contract lately negotiated between the Chinese Government and the British and Chinese Corporation for the construction of about 800 miles of railway between Nanking and Pingsiang, is one of the most important recently entered into in connection with the development of railway communication in China. The line will traverse and extremely rich portion of China, and will be the means of giving the railway already in operation between Shanghai and Nanking the assistance that it needs to make it at once a paying concern. Apart from this aspect of the question, the line will be of great assistance in developing the provinces of Anhwei and Kiangsi.



Sketch Map showing the proposed route of the Nanking-Nanchang-Pingsiang line.

The accompanying map shows the proposed route of the line. Roughly, it will strike almost due South from Nanking to the prefectural city of Ningkwo. A branch line will connect with Wuhu on the northern side, and with Kwang-te-chow to the East. From Ningkwo-fu, the route will be south-westwards to the prefectural city of Hweichow, and thence will proceed to Nanchang, the capital of Kiangsi province, whence it will run west by south to Pingsiang, the terminal of the short railway to Chuchow, on the line from Hankow to Canton.

In the past there was much talk on the part of the gentry to build lines to cover this route, but nothing tangible ever resulted. In 1913 the gentry of Kiangsi formed a company and established offices to build a line between Nanchang and Pingsiang,* a survey of the route having been made. The whole of the country traversed by the railway is under cultivation. It is somewhat mountainous, but rich in tea, cotton, and industries. There are extensive deposits of coal; and gold, silver, copper, and lead mines have been worked by native methods in the past.

Altogether, the project is one of great value to British interests, and while being of benefit in that direction, it cannot fail to be of tremendous importance in the opening up of China. The connection of Wuhu with the Hinterland is important, inasmuch as that port is a large distributing centre for the southern region. It is a Treaty Port, and already exports a largely quantity of rice, wheat, cotton, tea, timber, sugar, paper, furs and feathers, though rice, cotton and tea rank foremost as exports. Hweichowfu is situated in the richest section of Anhui province; is the centre of the tea packing district, enjoys the distinction or being important industrially, and is famous for its Indian ink, its engravings on copper, and its varnish. In other places, says Père L. Richard, silk is manufactured, and iron works are carried on.

* See FAR EASTERN REVIEW, March 1913.

Mr. S. B. Shen who is associated with the survey of the Nanking-Pingsiang Railway.

The agricultural products of Kiangsi province are chiefly rice, cotton tobacco, and hemp; tea being mostly grown in the northwest. The mineral wealth has not been availed of as much as it might have been except at Pingsiang—where the new railway will connect with the line already existing. There coal mines have been already in operation for some time.

Nanchang, the capital of the province, stands in the centre of an alluvial plain, and was originally built on the shore of the Poyang Lake, which has since receded 30 miles northward. It is an important treaty port, and has some manufactures.

The city of Jaochowfu is the great emporium for the sale of porcelain, while Kingtehchen, which will probably be tapped by the railway, is the centre of the oldest procelain manufactures in the province. This place was established in A.D. 1004 under an Emperor of the Northern Sung dynasty. The kilns destroyed by the Taiping rebels have been rebuilt, but the procelain turned out is far from equal in colour and finish to that of former times. At the present day it has some 160 furnaces instead of 500, and employs 160,000 workmen instead of 1,000,000, according to Père Richard. The finest procelain manufactured used to be despatched annually to Peking, the remainder being sold cheaply throughout the country; though a small amount of fancy articles is exported abroad.

"THE INDUSTRIAL HARBOUR"

An attractive catalogue with the above title has been issued by the Deutsche Maschinenfabrik A. G., Duisburg. The 152 pages are profusely illustrated with pictures of electrically driven travelling cranes, revolving cranes, locomotive cranes, slewing cranes with tilting bucket, with patent grab and so forth. Every kind of loading and transporting appliance is shown. Some idea of the extent of the operations of the Deutsche Maschinenfabrik A. G. can be gained from the fact that they supplied about 300 cranes to the town of Hamburg, 36 gantry cranes to the harbour at Montevideo, 20 gantry cranes to the harbour of Yokohama, 15 to Bremerhaven and a similar number to Ghent and nine to Genoa. Moreover the Company has built 63 giant and floating cranes. Its monthly turnover in 1912 was over three million marks.

This extremely comprehensive and complete catalogue will be of undoubted interest and value to those who wish to know the latest developments in the time and labour saving methods of handling and transporting heavy goods.

STANDARDIZATION OF ELECTRICITY SUPPLY IN CHINA

We have received the following communication from the Chairman and Hon. Secretary of the Standardization Committee of the Engineering Society of China:—

With reference to our recent letter to you on the above subject, we have pleasure in stating that a number of meetings have been held of the Committee appointed to consider the above subject and the following decisions and recommendations have been arrived at:—

(1) That—Generation and Distribution generally shall be on three-phase system at 50 or 60 cycles per second.

(2) That—Distribution shall be carried out generally on the four-wire 3-phase system with grounded neutral at a pressure of 250 volts between one-phase and neutral, i.e., 440 volts (approximately) between phases.

(3) That—The standard pressure for domestic lighting and similar supply shall be 250 volts.

(4) That—When it is not desirable or economical to use a four-wire 3-phase supply, then a three-wire system with neutral grounded or a two-wire system with one side grounded shall be adopted, in all cases the pressure to ground shall be 250 volts.

(5) That—The use of direct current systems shall be discouraged and they shall not be allowed for systems involving either over 50 K.W. in capacity or having feeder of over half mile in length.

(6) That—No fuses or switches shall be allowed in the Neutral wire.

(7) That—Where direct current systems are essential the generation and distribution shall be on the 3-wire system at 500 volts between outers, the neutral being grounded.

(8) That—The following pressures shall be considered as standards for High Tension transmission:—

2,200 volts, 3,300 volts, 6,600 volts.

Pressures above 6,600 volts to be as required by local and other conditions.

In connection with the above recommendations we may say that the Committee was unanimous with regard to the method of distribution on the four-wire 3-phase system as being most suited to Chinese cities.

A majority was in favour of 250 volts pressure (i.e., between one-phase and neutral) on the consumers permises those members operating systems of 200 volts and upwards were of the opinion that the higher pressure of 250 volts would involve practically no additional risk, but would be distinctly advantageous as regards economy in copper, regulation, etc., the system would also allow the use of 440 volt motors on the same mains as the lighting, and thus render unnecessary the use of different mains for lighting and for power, which in Chinese cities would be prohibitive on account of cost, the relatively low price that could be obtained for electric power and also the fact that power loads are very scattered.

In connection with the above, we may state that the American and French representatives were opposed to a maximum pressure on the secondary side higher than 250 volts, i.e., 125 volts to neutral.

Little trouble in the regulatian of lighting due to interference of power loads is anticipated, as it is found by experience that these loads generally do not coincide. The decision to allow both 50 and 60 cycles as standard frequencies was arrived at as it was considered that a single standard of 50 cycles would not receive support from American manufacturers and the use of 60 cycles would allow of cheaper plants where first cost is of paramount importance.

We may add that practically all cities in China having electric supply systems, use overhead mains almost to the exclusion of underground cables.

NEW BUILDINGS IN SHANGHAI

Demolition of old buildings and the erection of new premises is going on all over the Foreign Settlements of Shanghai. On April 7 the premises recently erected for Messrs. Maitland & Co. on Canton Road were thrown open to inspection. They are built in the form of a quadrangle and from the front present the appearance of wings linked up by a glazed court. The building is constructed of brick and is 140 feet in length. The four floors of the eastern wing are given over to godown space and the ground floor of the western wing is also devoted to this purpose. The first floor of the western wing accommodates the compradore and staff, but there is also some godown space available. On the second floor there is further provision for storing goods. The auction room, 60 by 45 feet, a sample room, reception room, manager's room and accommodation for the staff are on the third floor. Elaborate precautions against fire have been taken and the premises are excellently lit and ventilated.

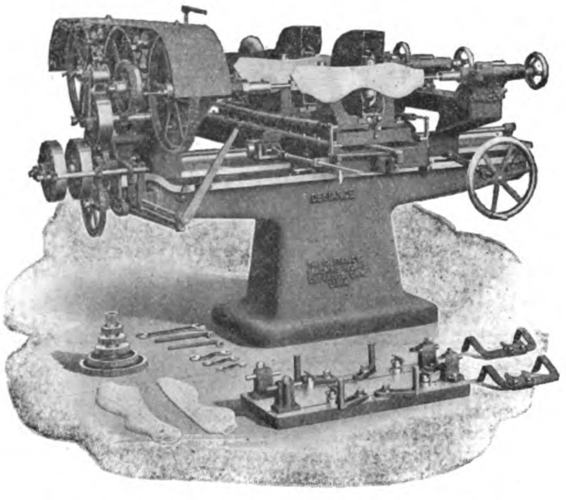
The building was designed by Mr. A. E. Algar, architect, and was erected under his supervision. The contractor was Chang Yi-zung, who is also building the new premises for the Banque de l'Indo-Chine on the Bund. Messrs. Anderson, Mayer & Co. supplied and erected the lifts, the water and fire service has been carried out by the Shanghai Waterworks Co, and the Shanghai Dock & Engineering Co., Ltd., and the New Engineering & Shipbuilding Works, Ltd., were responsible for the construction of the steel work, the latter supplying the circular iron columns for the support of the floors. The former constructed the roof of the cargo space, which includes a new pattern of glazing bar made by Messrs. W. H. Heywood & Co. and imported by Messrs. Duncan & Co. The girders carrying the flooring were imported from Messrs. H. J. Skelton & Co., London.

In the report of the Municipal Engineer for March it was stated that the total number of houses under construction for the three months ended March 31, 1914, was 2,394 as against approximately 1,350 during the corresponding months in 1906, in which year a record number of houses was erected. If the boom in the building trade continued, and there was every reason to suppose that it would, the Municipal Engineer thought that the total number of houses erected in 1914 would reach close upon 9,600, which would be an increase of 4,200 over 1906.

NEW "DEFIANCE" PRODUCT

The No. 303 Patent Double-Head Automatic Copying Lathe, as shown by the accompanying engraving, is especially designed for turning irregular shapes such as hatchet handles, hames, side-bars for saddles, golf stick heads, gun stocks, spokes and other wooden articles from the smallest sizes up to 7" diameter by 38" long. It will produce exact facsimiles of any model placed into the machine. By a simple quick adjustment of the tail stocks, either end of the product can be made larger or smaller than the governing model. One pattern is used to govern both cutterheads which will produce two pieces of an exact duplicate at one time, or one right hand and one left hand piece of the same shape can be turned.

An ingenious centering device can be furnished when so ordered for centering the stock before it is placed into the machine. By this method small stock in the rough can be used which effects a large saving in material. This device locates the center marks, quickly and accurately. Two sets of adjustable stops are furnished for centering right and left hand pieces which avoids disturbing either adjustment.



No. 303 Automatic Double Copying Lathe

The feeding mechanism which controls the cutterhead carriages, is arranged to feed either from right to left or from left to right alternately, or it may be adjusted to feed in one direction only. The starting station may be at the right or left hand end of the machine as desired. It has five changes of feed from 1/8" to 3/8", varying 1/16" to each revolution of the work being turned, and it can be started or stopped instantly. Adjustable stops are provided for automatically regulating the length of travel to the cutter-head which can be instantly set for any length of turning within the range of the machine.

The cutterheads are fitted with six right and six left hand knives to feed both ways and will turn successfully either hard or soft wood. They are mounted upon sliding frames, supported by substantial carriages which travel across the path of the material to be turned by means of heavy screws driven by double friction feeds which are automatically disengaged when the end of the cut is reached. The frames supporting the cutterheads and guide rollers are gibbed to the carriage and vibrate in a path to correspond with the shape of the model placed into the machine, and they are connected with convenient hand levers to bring the cutterheads up to their work or throw them back out of the way, which can be accomplished while the machine is in motion.

The counter is furnished as follows: Shaft 1 11/16" diameter by 96" long; three No. 1 roller bearing drop hangers, fitted with rack and pinion belt shifting apparatus; one drum for driving cutterhead 16" × 44"; two flange feed pulleys, 2 1/2" × 2", for driving feed screws; one two-step cone pulley 6" × 4" × 2 1/2" for revolving stock and pattern, tight and loose pulleys 12" × 5", with the loose pulley fitted with sectional bronze bearings; speed 625 revolutions per minute.

Further particulars and price will be furnished by its makers. The Defiance Machine Works, Defiance' Ohio, U. S. A.

BANGKOK'S WATER SUPPLY

At Chiengrak, near Bangkok, are situated the buildings connected with the water supply scheme of Bangkok, soon to be put into full working, says the *Siam Observer*.

The water supply scheme was decided on in 1911 and tenders were invited by the Sanitary Department for the installation necessary. The work was put in hand some months later and is now almost completed. There was a hope that the formal opening of the water supply station by His Majesty might be possible at the beginning of the Siamese New Year; but, if circumstances do not permit of this date, we are assured that the postponement of the opening will not be for long.

THE CHIENGRAK STATION

As most are aware, the water for the use of Bangkok is brought from a point on the river Menam some twenty miles north of the capital. This water is conducted to the Chiengrak Station by a canal about which, *en passant*, we may here take the opportunity of contradicting a certain rumour which has been disseminated locally. This rumour is to the effect that boats and barges will be allowed to use this canal with the result that the water will arrive in a very polluted state at the Pumping Station. We have authority for saying that such a statement is wholly incorrect, and can have been circulated only for a malicious purpose.

In the Chiengrak station the first building that attracts attention is the Pumping House. Here have been installed two low lifting and three high lifting electric pumps of the well known centrifugal pattern made by the A.E.G., the work of installation having been carried out by the local Electricity Company. The low-lifting pumps force what is termed the "raw" water (that is unfiltered water) into the subsiding basins which will be described later, and the "high-lifting" pumps are for the purpose of conveying the water to the elevated reservoirs at Wat Sakhet *after* it has been purified. The pump-house building has been erected by Mr. G. Kluzer and is a fine piece of work, its handsomely tiled floor and general character eliciting much admiration.

CLEANSING THE WATER

From the pumping chamber the raw water is conveyed and on its way is subjected to a solution of sulphate souminea which is prepared in another building in the following manner: The solution is first made of the strength per gallon decided on as necessary by analysis. It is then put into a dissolving box and agitated by an air compresser, after which it is carried by a vulcanised rubber pipe to meet the raw water as previously stated. There are five regulating cocks for regulating the amount of aluminea solution required for the water to be passed into the twelve filters, as well as a supplementary cock which may be used if necessary. The amount of solution thus employed is subject to the medical officer's instructions and is therefore always adequate and scientifically measured.

The raw water then, having been well mixed, with sulphate aluminea solution, is pumped into four chambers technically known as "subsidence basins" but more commonly termed "settling tanks" of reinforced conerete. Here it is allowed to coagulate, and the heavier impurities are precipitated in the manner familiar to Bangkok residents who are wont to have alum placed in their water jars.

THE FILTER CHAMBER

Having thus been coagulated, the water has reached a comparative state of purity but there may be other noxious elements such as the bacteria and bacilli of disease in it of which it is yet necessary to get rid. From the subsidence basins, therefore, the water is now carried to the filter chamber and this is perhaps the most interesting part of the whole establishment. Like the subsidence basins and the coagulating tank, the filter house building is the work of United Engineers Ltd. to whom these contracts were entrusted: while the filters themselves are on the excellent system patented by the Jewel Filter Co. of New York and London whose representative Mr. George E. Hopkins was sent to Bangkok and has superintended the carrying out of the work necessary in a highly satisfactory manner.

There are twelve Jewel filters in all, and the process to which they subject the water arriving from the coagulating tank is a most interesting and ingenious one. These filters consist of an inner and outer tank. In the former is placed a quantity of exceedingly fine sand to a depth of some one and a half metres. The water from the coagulating chamber flows up the outside tank and over a weir into the inner tank containing the sand through which it passes, being subjected *en route* to the well known purifying virtue which sand possesses. The sand of course after a certain time needs washing, but there is an extremely ingenious indicator showing automatically when washing is necessary. When the indicator registers this stage water then flowing, be it noted, is cut off automatically.

METHODS OF WASHING SAND

Washing is necessary on an average once in fourteen hours and is done by pure water obtained from the filters. This is conveyed up through the sand which is agitated by a sort of rake, and afterwards the water travels through the outer tank and is allowed to run out to waste. When the washing has again cleared the sand to the medical officer's satisfaction of the impurities it has collected, the washing apparatus is shut off and filtration proceeds again.

This filtered water whose purity is guaranteed at 98 per cent. is now in an entirely drinkable state, and is collected in a small chamber and flows to the clean water reservoirs whence it is pumped by the high lifting pumps through an immense supply pipe to the elevated reservoirs whose water towers are familiar landmarks near Wat Sakhet. In these water towers the drinkable water rises to a height sufficient to obtain pressure throughout the city.

Bangkok has every reason to congratulate itself on its good fortune in possessing a water-supply installation of the most modern and elaborate character comparing favourably with, and in numerous instances excelling that of, other great cities in the world. The supreme control of the entire work has been in the capable hands of Mr. S. R. de la Mahotiere, Director of the Sanitary Department, and his assistant Mr. Didier.

The construction of no fewer than four new lines of tramway is proposed for Jerusalem, says the Constantinople correspondent of *The Times*. All will start from the Jaffa Gate, on the western side of the city wall. One will run through the principal commercial quarter and the new Jewish suburbs for two miles along the Jaffa road. Another, branching northwards, will serve another mass of Jewish settlements. A third, bearing to the northeast past the New Gate, and running for a while more or less parallel with the city wall, will then turn northward, passing the Tombs of the Kings, and follow the Damascus road to the head of the Valley of Jehoshaphat. The fourth line contemplated will run from the Jaffa Gate to Bethlehem, some six miles to the south. None of these lines enters within the walls of the old city, the streets of which are too narrow to admit trams without extensive and costly expropriation and demolition. By the terms of the concession the municipality is to become owner of the tramway after forty years. First-class fares will not exceed 1½d., except between the Jaffa Gate and Bethlehem, a journey costing 3 piastres (6d.)

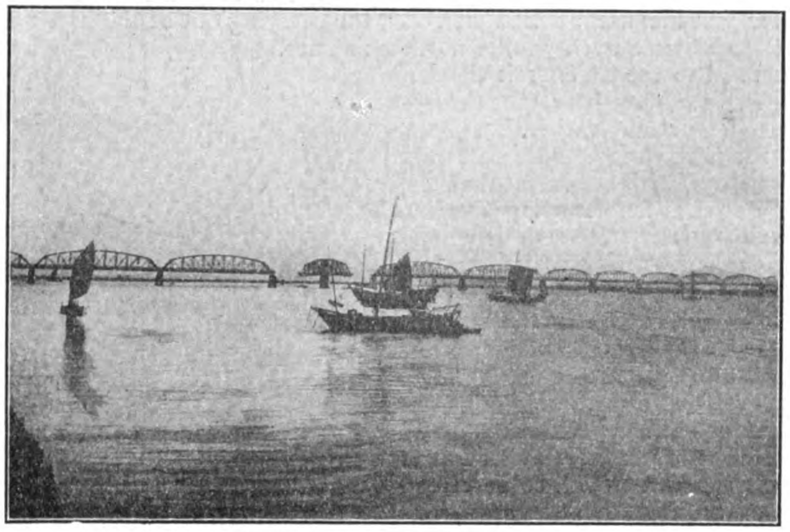
TRADE AND INDUSTRIES OF CHOSEN

[BY CONSUL-GENERAL GEORGE H. SCIDMORE, SEOUL]

The foreign trade of Chosen (Korea) has increased from $11,613,334 in 1901 to $43,874,330 in 1912. In the latter year imports were valued at $33,423,493 and exports at $10,450,837, as compared with imports of $26,935,665 in 1911 and exports of $9,390,764.

The continued excess of imports over exports is largely due to the causes referred to in previous reports, namely, the political and economic relations of Chosen with Japan. The maintenance of its army garrison, civil, police, and judicial departments, railways, posts, telegraphs, education, harbors, roads, and other public works still imposes upon Japan the expenditure of many millions in excess of revenues obtained from Chosen.

In addition to general merchandise, the movements during 1912 of specie and bullion were: Exports, $5,041,867; imports, $733,760. Compared with 1911, these movements, show a decrease of $1,477,906 in exports and of $1,626,384 in imports.



Railway Bridge over the Yalu River.

DISTRIBUTION OF CHOSEN'S TRADE

The trade of Chosen during 1912 shows increased exports to Japan, Great Britain, China, and Belgium; decreased exports to the United States, Germany, France, Russia in Asia, and other countries; and increased imports from all countries, except France.

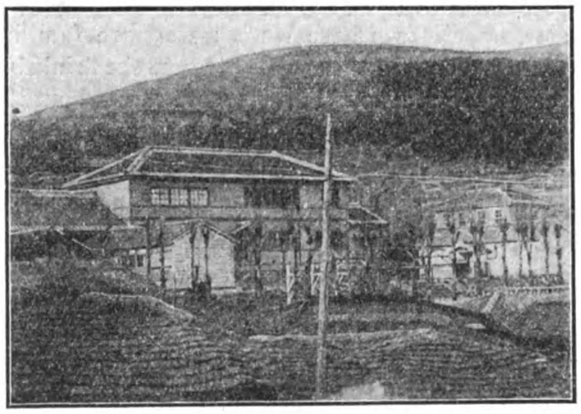
CUSTOMS RECEIPTS—SHIPPING

The Customs receipts of Chosen during 1912 amounted to $2,523,433, as compared with $2,100,765 in 1911. The source of the receipts in 1912 was as follows: Export duties, $210,772; import duties, $2,218,818; tonnage dues, $46,692; other recepsts, $47,151.

The tonnage of vessels entering the ports of Chosen in 1912 was 3,888,353 and that of those cleared 3,827,022. Of the tonnage entered, steamers accounted for 3,735,892, sailing vessels 63,058, and junks 89,403; of the clearances, steamers accounted for 3,684,299, sailing vessels 58,472, and junks 84,251.

TRADE WITH THE UNITED STATES

Invoices certified at this consulate general show the value of exports from Chosen during the year 1912 (exclusive of returned American goods valued at $649) to have been $45,627, of which the principal items were gold and copper concentrates $37,142, household effects $3,573, and cabinet ware $1,483. The customs returns, however, show a total value under this head of $47,585, a decrease, compared with the year 1911, of $427,180. The year 1911 was exceptional, owing to shipments, valued at $419,707, of old Korean copper and brass coins that had been withdrawn from circulation and were sent to the United States to be melted down as scrap metal.



An Industrial School at Fusan.

During 1912 the value of imports from the United States was $3,217,094, an increase of $1,095,164. This increase appears principally under the heads of agricultural tools and machinery, bicycles, building material, chemicals, clothing, comestibles, flour, salted fish, surgical instruments, galvanized iron, nails, pipes and tubes, miscellaneous manufactures of iron and steel, leather, condensed milk, kerosene oil, lubricating oil, railway supplies, soap, tin, and tobacco. Decreases are noticeable in cotton goods, electric-light apparatus, and timber.

FINANCES—BANKING

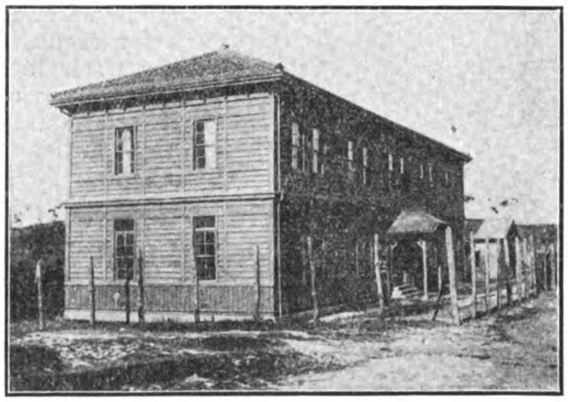
The budget of Chosen for the fiscal year ended March 31, 1913, estimated a revenue to produce $26,116,220, of which $13,312,701 was expected from ordinary sources, while the balance was to be obtained from the following: Balance brought over from previous year, $380,142; loans, $6,273,077; transferred from budget of Imperial Government, $6,150,300. This shows a continuing necessity for extraneous assistance to the sum of $12,423,377. Compared with the preceding year, the increase in estimated revenue amounted to $1,957,446, of which $1,441,678 was ordinary and $515,768 was extraordinary in origin.

The total contemplated expenditures amounted to $26,116,220. Increases in various lines were as follows: Communications, $155,120; railways, $716,857; encouragement of industry, $76,530; land investigation, $310,290; Seoul waterworks, $88,563.

The growth of the postal savings banks in recent years has been very rapid. In 1912 depositors numbered 338,176, as against 182,763 in 1911 138,184 in 1910, 106,644 in 1909, and 60,587 in 1908. Deposits in 1912 amounted to $2,406,924 as compared with $1,959,777 in 1911, $1,540,578 in 1910, $1,161,167 in 1909, and $634,478 in 1908.

On December 1, 1912, the rate of interest on deposits in the postal savings banks was raised from 4.2 per cent. to 5.4 per cent. In explanation of this change, the director of the Postal Money Order and Savings Bank Office is reported as saying.

The present measure, in the opinion of the authorities concerned, is very timely. The rate of interest on bank deposits is, as a rule, higher in Chosen than in Japan proper. During last year, for instance, the rate of interest of fixed deposits in banks was 5.7, or in case of agricultural banks 5.5 per cent. per annum in Chosen, while it was only 4.7 or 4.8 in Japan proper. But the rate of interest on deposits in the Postal Savings Bank in Chosen was the same as in Japan proper. Needless to say this is a failing which is not associated with the tendency of the money market in Chosen. As it is, however, the raising of the rate of interest just effected is viewed with some misgivings by some people who seem to consider that this will result in diminishing deposits in general banking corporations in Chosen. This is an unnecessary fear, however, as banks in Chosen are established only in cities, where in the matters of deposit they are favored with constant local customers, so that the Postal Savings Bank is only able to invite deposits that are not deposited in banks. This being the case, there need be no fear that the raising of the rate of interest on deposits in the Postal Savings Bank will impede the industry of private savings banks if the raised rate does not exceed the general bank rate. It may be mentioned that the raised rate of interest is still lower than the bank rate in Chosen, so that it is simply absurd to suppose that the banks will be deprived of the greater part of their deposits, and that the Postal Savings Bank will absorb such.



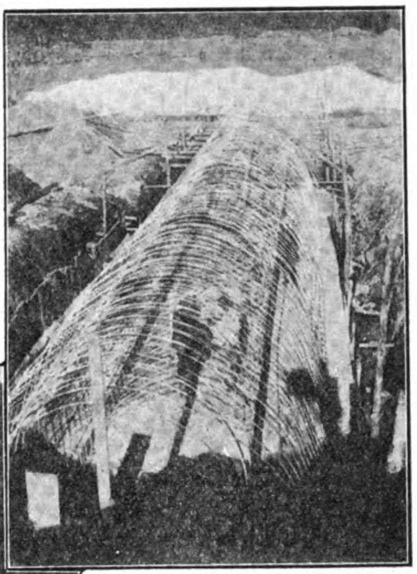
An Agricultural School at Pying-yang.

Though a great development has recently been made by Koreans with regard to the economical condition, they are still lacking in the habit of saving, so that it is a matter of first importance at present to induce them to utilize as far as possible organs for saving. How much they fail in making savings may well be shown by the fact that of the total amount of savings in Chosen, amounting to 5,000,000 yen ($2,490,000), only 630,000 yen ($313.740), or one-eighth belongs to Koreans. Under the circumstances, no one will deny that encouragement of savings among Koreans is greatly to be desired, and consequently measures taken to inculcate in them the habit of saving are to be approved.

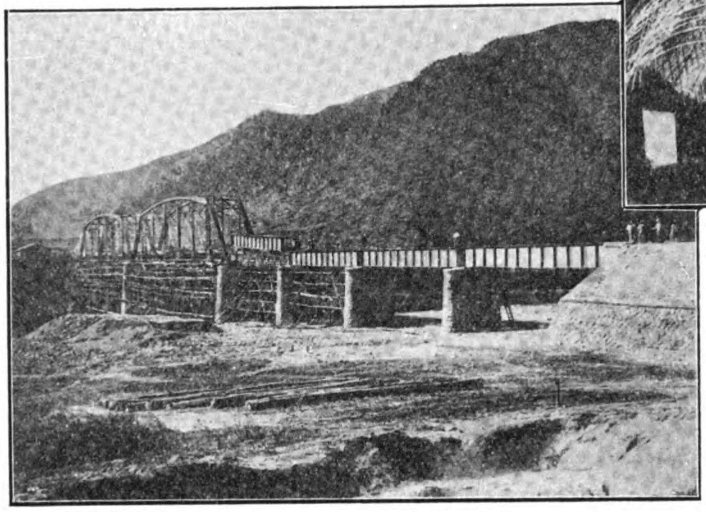
During the latter parts of 1912 the Oriental Development Co., negotiated a loan in Paris for 20,000,000 yen ($9,960,000) for the purpose, it is understood, of enabling the company better to carry out its schemes for the advancement of various industries in Chosen and the encouragement of immigration from Japan. This company came into existence in December, 1908, with an authorized capital of 30,000,000 yen ($14,940,000), of which it is reported one-fourth has been paid up, and with an annual subsidy from the Japanese Government of 300,000 yen ($149,400) to extend over a period of eight years.

RAILROADS

In February, 1912, the Railway Bureau of the Government General announced the arrangement of a triweekly through express train service between Seoul and Changchun (673 miles,) connecting at the latter place with the trans-Siberian route to Europe, and reducing the time of travel from Seoul to Moscow to 10 days, to Berlin to 11½ days, and to Paris or London to 12½ days. The trains of this service are composed of the most modern and comfortable sleeping and dining cars and carry first-class passengers only; and judging by the increasing numbers of tourists and others using them, are giving satisfaction. The journey between Seoul and Peking was, at the same time, reduced in duration to 2½ days, and that between Seoul and Tokio has been shortened by 4 hours. In June, 1912, the through express service without change of cars was extended to Fusan.



Tunnel construction with Concrete and Iron Frames.



Railway Bridge Construction on Keijo-Gensan (Wonsan) Line.

The following summary of progress of railway construction in Chosen was published by the *Seoul Press* of December 18, 1912:

As it is known by the public the greater part of the Honam Railway and the Seoul-Wonsan Railway from Seoul to Cholwon, have already been opened to public traffic. As for the remaining sections, the director of the construction section of the railway bureau of the Government General, as quoted by the *Keija Nippo*, says that they will in all probability be finished by the summer of 1914 and open to public traffic. Work on the Honam Railway, from Mokpo to Hakkyoli, some 22 miles in length, is expected to be completed by next June, but its opening to public traffic will probably be postponed until August, in order to avoid probable damage to the line from floods in the rainy season, which usually sets in Chosen in July. The section from Hakkyoli to Laju, 13 miles in length, is also expected to be open to public traffic at the beginning of October. With the opening to public traffic of the Mokpo-Laju section, the Honam Railway will be completed, except between Laju and Chyongeup, 43 miles in length, which distance will require the piercing of several tunnels. Work on this section will be very difficult, but it is expected that it will in all probability be completed by the summer of 1914, when an opening ceremony of the whole Honam line will be celebrated on a grand scale at Mokpo or some other suitable place.

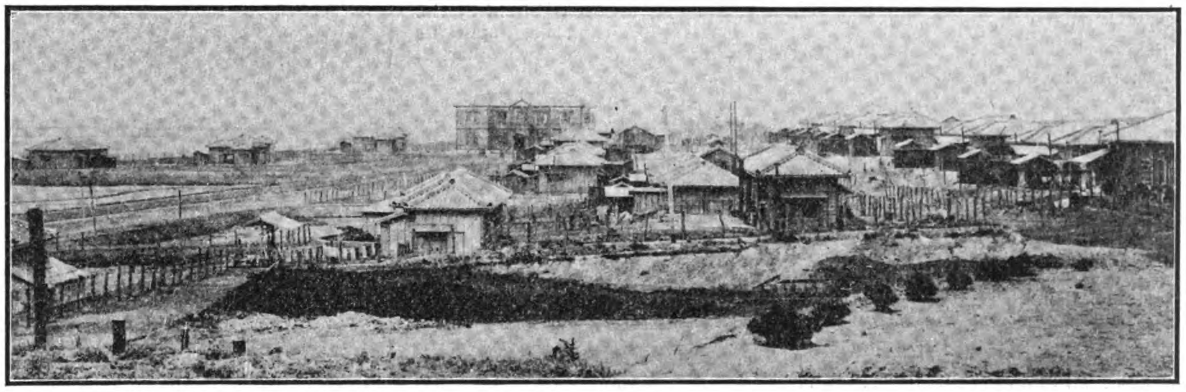
In contrast to the measures, taken with regard to the Honam line—that is, the finishing it within the shortest possible period—the construction of the Seoul-Wonsan Railway is being engaged in with a view to permanency, For instance, iron is used in the construction of bridges on the Seoult Wonsan Railway, where wood is used on the Honam Railway. A circuitous route, to avoid boring tunnels, is resorted to for the Honam line, but on the Seoul-Wonsan line the boring of tunnels is not postponed unless of necessity. As it is now the cold season, work on the Seoul-Wonsan Railway is suspended. It will be resumed as soon as the warm season sets in, and the section between Cholwon and Pokkei, 16 miles in length, is expected to be finished and open to public traffic at the beginning of August next year. From Pokkei to Keumpulrang, 10 miles in length, traffic will be run by the middle of October at the latest It will be remembered that work on the Seoul-Wonsan line has been started from Seoul and Wonsan at the same time. The track from Wonsan to Sokwangsa, 18 miles in length, is expected to be finished by August next year; that from Sokwangsa to Kosan, 9 miles in length, yb November of the same year. With the completion of these two sections, work on the Seoul-Wonsan Railway will be incomplete only between Kosan and Keumpulrang. The distance is 24 miles, work on which is expected to be very difficult, owing to the geographical features of the place. The boring of 16 tunnels will probably be necessary, and bridge work will be carried on under very considerable difficulty. Work on this section will, however, be completed early in 1914 when a grand opening ceremony of the whole Seoul-Wonsan line will be given, probably at Wonsan.

AGRICULTURE—GINSENG, SILK, COTTON

Previous to its culture and sale being made a Government monopoly in 1908, Korean ginseng had long held a foremost place in the esteem of the Chinese and other believers in its medical virtues, until gross mismanagement and peculation had brought the industry to almost complete ruin. Since that year many reforms have been introduced in the cultivation of the plant, in the eradication of its diseases, and in the manufacture of medicine from its root, and present prospects indicate that it will be soon restored as a profitable source of revenue. Plants renewed four or five years ago are now approaching maturity, and the profits from sales, which in 1911 amounted to $85,860 are reported to have risen to $190,385 in 1912l while it is estimated that the profits during 1913 will reach $352,016. In the latter part of 1912 the best quality of medicinal ginseng sold in Chosen at the rate of $40.84 per pound.

There are now over 116 sericultural training institutes established by the Government General in Chosen, and a large staff of itinerant lecturers is employed in giving instruction and aiding in the introduction of new stocks of silk worms and new methods of work. This industry gives abundant promise of prosperity. The product of Korean cocoons during the year 1912 is estimated to have been about 150,000 bushels.

The estimated area of land in Chosen suitable to cotton growing is 1,280,000 acres, and the Government General is continuing its efforts to encourage the introduction of American upland seed. These efforts have been followed by very satisfactory results. The value of the exports of Korean cotton during the past four years was as follows: 1909, $135,966: 1910, $151,833; 1911, $125,640; 1912, $216,927. Nearly all of these exports went to Japan. The crop of 1912 was, in September, 1912, estimated at 37,527,666 pounds.



Government salt manufacture station at Koryo Bay, near Chinnampo.

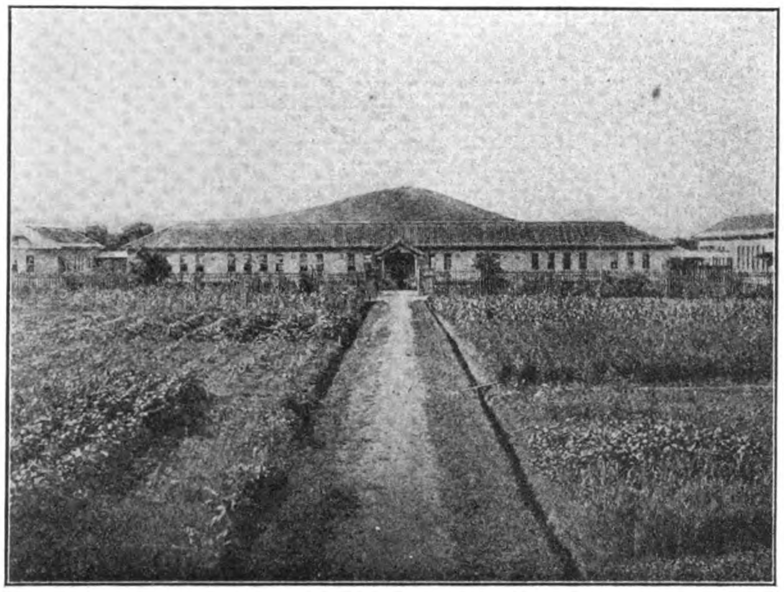
RICE AND OTHER CROPS

The Korean rice crop of 1912 is estimated in round numbers at 44,348,100 bushels, a decrease of 4,136,900 bushels as compared with 1911. Disastrous floods were the principal cause of this decrease. The introduction of a superior kind of Japanese rice seed, known as wase shinriki, has been followed by most encouraging results. Compared with the Korean seed heretofore in general use, it is said to require a smaller quantity of manure, yields some 35 per cent. more, brings a price per koku (about 5 bushels) higher by $1, resists insects and floods, and is of superior quality when cooked.

MINING RETURNS

Gold mining in Chosen during 1912 continued to give steady and satisfactory results. The following data are from reports of the leading companies engaged in this industry.

The Oriental Consolidated Mining Co., an American corporation operating in the northwestern part of Chosen, as heretofore leads all others in the amount of its capital and the extent of its operations. Its report for the year ended June 30, 1912, published September 6, 1912, shows total receipts of $1,562,109.77; operating costs, $864,490.98; operating profit, $697,618.79; returned to development, construction, etc., $45,092; net receipts, $652,526.79; tons of ore mined, 321,343; mining cost per ton, $1.62; value of bullion sent to Osaka Mint, $1,549,204.50; estimated ore reserves, 741,000 tons, valued at $3,849,000.



Agricultural and Dendrological School attached to model farm in Suwon.

The Seoul Mining Co., incorporated under the laws of Connecticut and operating in Hwang Hai Province, reports for the year ending December 31, 1912, a total recovery of $594,872; operating expenses, $221,200; net profit, $373,672.

The Chiksan Mining Co., recently organized under the laws of West Virgina with a capital of $1,000,000, during 1912 devoted most of its work to the erection of new stamp mills and other machinery, to development, and to the prospecting of placers. The area of its concession covers about 260 square miles.

The Kapsan mining concession in the north of Chosen is held by the Collbran-Bostwick Development Co., of Hartford, Conn., and contains extensive deposits of copper, and covers an area of 50 by 88 miles. Development work was continued during 1912.

MINING CONCESSIONS—MINERAL EXPORTS

The following statistics, furnished by the Mining Bureau of the Government General, show the number of mining concessions of all kinds held in Chosen on December 31, 1912:

Nationality of holders.	Mines.	Placers.
Japanese	391	98
Koreans	195	148
Japanese and Korean	20	19
English	6	1
American	19	10
Japanese and American	4	......
Korean and American	1	......
German	5	......
French	3	1
Italian	1	1
Russian	1	......
Total	646	278

The value of the exports of mining products from Chosen during 1912, according to the report of the Mining Bureau, was as follows: Gold, $4,689,285; silver, $16,000; copper, $1,531; iron, $155,221; graphite, $82,309; coal, $166,522; total $5,110,868.

NEW LEGISLATION

By ordinance of March 18, 1912, the Government General extended in operation over Chosen a very large and important body of Japanese laws, including the civil code, the commercial code, the code of civil procedure, the bankruptcy law, and others of a general character, and a complete reorganization of the courts was effected. In causes where both parties are Koreans the force of ancient customary, or common, law is preserved.

By order of the Governor General on March 28, 1912, the functions and duties of the various departments and bureaus of the government were rearranged, with a view to greater efficiency and economy. On March 28, 1912, laws and ordinances were promulgated whereby the export duties on rice and most other articles were abolished.

By ordinance taking effect April 1, 1912, the laws of Japan comprised in the criminal code, the code of criminal procedure, and laws subsidiary and supplementary thereto, were extended over Chosen, and the old Korean criminal laws were repealed. Other ordinances, taking effect at the same time, made provision for the systematic registration of all matters affecting titles to real property.

On August 13, 1912, an ordinance and regulations were issued, supplementing and, in a few particulars, modifying previous measures relating to land surveys and titles. On August 21, 1912, an ordinance was issued for the control of the manufacture, sale, transportation, and keeping of firearms and ammunition. On October 24, 1912, an ordinance controlling the business of banking was issued. On December 17, 1912, an order of the Government General was issued providing for quarantine measures in connection with the importation of trees and plants.

POPULATION

On December 31, 1911, the official estimate of the total population of Chosen was 14,055,869, comprising 210,689 Japanese, 13,832,376 Koreans, 11,837 Chinese, 967 other foreigners.

Under the head of "Other foreigners" are included: Americans, 568; British, 183; French, 100; Germans, 49; Russians, 26; Norwegians, 12; Turks, 8; Austrians, 6; miscellaneous, 15.

The population of Seoul, the capital, on February 29, 1912, was estimated at 291,549, of whom 46,061 were Japanese, 2,099 Chinese, and 258 other foreigners.

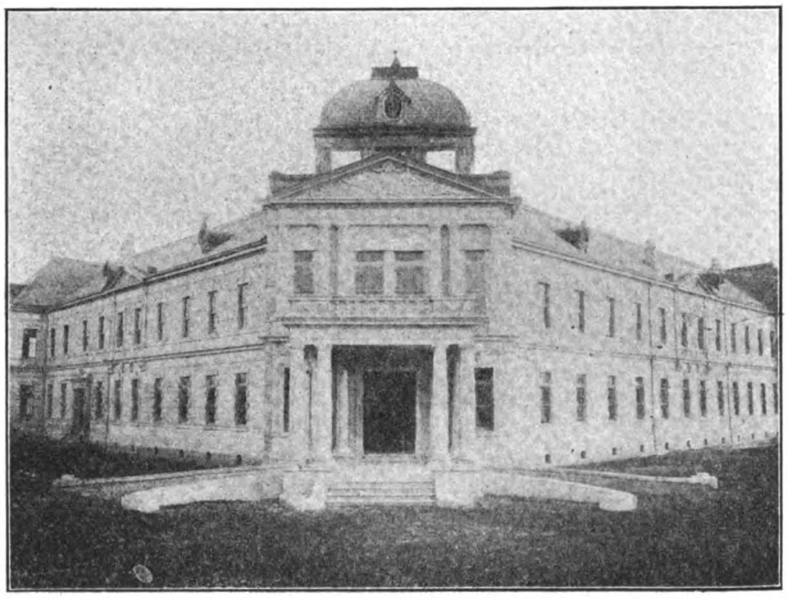
HIGHWAYS AND STREET IMPROVEMENTS

According to a statement credited to the Director of the Public Works Bureau of the Government General it appears that it is proposed to expend for road construction and improvement in Chosen the sum of $4,980,000, covering a period of five years, beginning with 1911. About 500 miles of the more important roads contemplated in this scheme were expected to be completed by the end of March, 1913, at a cost of $1,743,000.

In place of the narrow, tortuous, and insanitary lanes which have heretofore characterized Seoul there are now in rapid course of construction paved and macadamized thoroughfares, having widths, 1 of 180 feet, 1 of 115 feet, 3 of 90 feet, 5 of 72 feet, 5 of 60 feet, and 15 of 48 feet. It is estimated that these improvements will cost about $6,474,000.

CHOLERA.—HOSPITALS

During September, 1912, a few cases of cholera appeared at Chinnampo and Fusan, but the police authorities took immediate and most effective action and provented its spread. In this and in other directions the excellence of the sanitary organization of the Government was most strikingly illustrated.



The offices of the Oriental Development Company at Keijo.

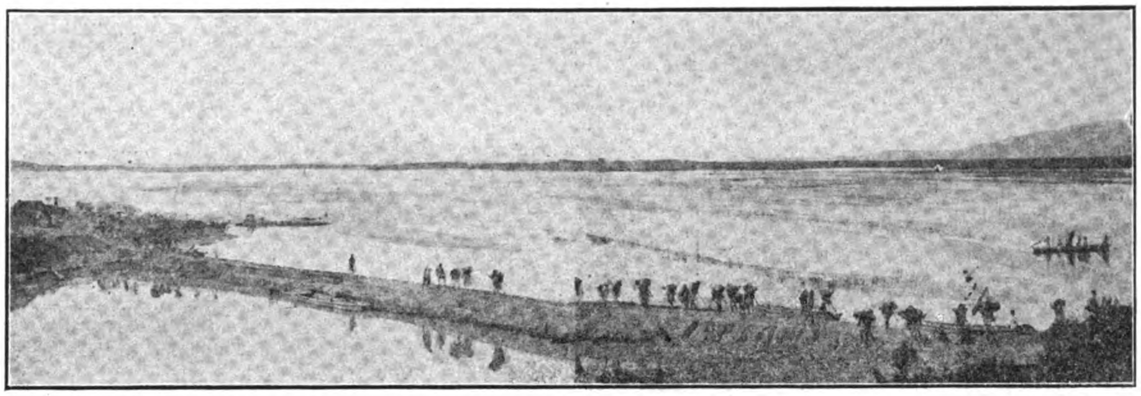
The pioneers in effective medical work in Chosen were the American missionaries, and their well-equipped hospitals and dispensaries continue to expand in usefulness. At each of the gold-mining concessions under American control excellent physicians are employed and they annually treat thousands of charity patients in addition to employees. These beneficent efforts are now, of course, overshadowed by the measures under Government control. In November, 1912, the number of hospitals in Chosen was reported as 124. During the year 1912 the patients treated at the Government General Hospital at Seoul are reported as numbering

48,490, while in 18 other Government provincial hospitals the number is said to have been 206,752.

FORESTRY—EDUCATION

The efforts of the Government in connection with reafforestation are attended with good results and the interest and co-operation of the people in this matter are becoming more manifest. The heretofore barren hills of Chosen are steadily assuming a better aspect and Arbor Day (April 3) is now an established success.

On January 6, 1912, the Governor-General published in the Official Gazette the rescript on education of the Emperor of Japan of October 30, 1890, to be read frequently and observed in schools in Chosen as a basis of ethical instruction. This rescript inculcates filial piety, affection between brothers, sisters, husbands, and wives, fidelity to friends, modesty and moderation of demeanor, the pursuit of learning, the cultivation of the arts, respect for and observance of the constitution and laws, and loyalty to and self-sacrifice for the State in emergency. The private schools of Chosen in January, 1912, numbered 1,721, of which 677 were religious and 1,044 secular. Figures recently published show the very creditable results accomplished by Chosen in lighting its coasts in comparison with other parts of the Japanese Empire. In Japan proper there are 137 old-style and 92 new-style lighthouses; in Formosa, 9 old-style and new-style; in Chosen, 14 old-style and 59 new-style.



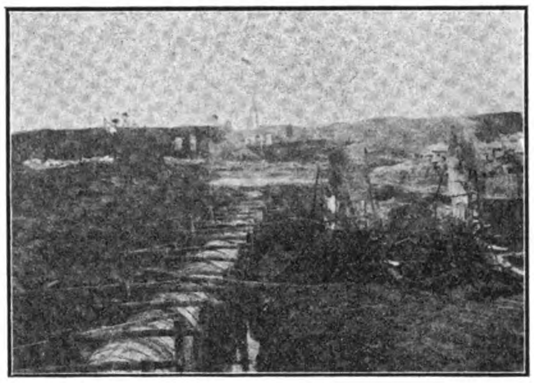
The Yokyo Water Reservoir, maintained by the Rinyeki Water Conservation Association.

STEAMSHIP SERVICE, HARBOR WORKS, SALT INDUSTRY, ETC.

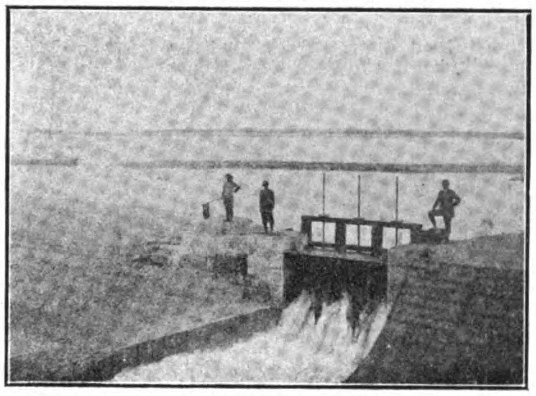
In March, 1912, a number of small steamship companies engaged in the coastwise trade were amalgamated under the name of the Chosen Yusen Kaisha (Chosen Mail Steamship Co.), and provision is made in the budget of the coming year to give it an annual subsidy of 316,761 yen ($157,747).

Excellent waterworks now exist at Seoul, Chemulpo, Fusan, and Pyongyang, involving an expenditure of $3,935,000, and others are in course of construction or projected for nearly all of the principal towns of Chosen.

Work on the large tidal basin and docks at Chemulpo is progressing rapidly. At the end of the year 1912 about $566,000 had been expended on it, and four more years are given as the period required for its completion, at a total estimated cost of $1,734,730. The manufacture of salt by evaporation is mainly a Government enterprise in Chosen and the areas of pans are being extended. To supply the demand of the Korean market large quantities of crude salt are imported from the Kwantung Province of China and refined by private firms at Chemulpo. In May, 1912, heavy storms caused great damage to pans along the Korean coast and reduced the expected output. The total amount of Korean salt produced during the year 1912 is reported as 14,832,087 pounds.



Drain pipe route constructed with wooden tubes by siphon process.



The first barrage.

The construction of a naval station and new city at Chinhai (Masampo) is being pushed with great vigor by the Japanese authorities and its population is rapidly increasing. It is predicted that this place will soon become one of the most important commercial and industrial towns of southern Chosen. The navy yard there will probably be completed during the year 1914.

A noticeable item among the imports into Chosen from the United States during the year 1912 is that of salted herrings, the value of which was $128,490. This indicates that the rich sources of supply of fish on the Korean coast are not yet properly exploited.

CHINA'S REVISED BUDGET

The total revenue for the second financial year (July 1913-June 1914) as estimated in the original Budget of the Republic of China, was $646,358,109, and that of the revised Budget is $557,296,145, thus showing a decrease of $89,061,914. The total annual expenditure was estimated in the original Budget at $646,358,109, and in the revised Budget at $642,236,876, showing a decrease of $4,121,233. This reduction is due to causes explained as follows by the Ministry of Finance:

"Under the figures given in the schedule of revenue of the original Budget, the heaviest item is that for loans. It is divided into two categories, e.g., (1) Foreign Loans, amounting to $199,000,000 and (2) Domestic loans, amounting to $129,800,000. In the case of foreign loans the amounts are fixed and can be relied upon. As regards domestic loans ($129,800,000) whether the amount provided for can be obtained in full is difficult to foresee. When the annual expenditure had been on the previous occasion estimated at such an enormous figure, and the deficit was correspondingly large, the amount of the domestic loans was simply entered as a method of balancing the receipts and payments. Under the present conditions, we must, however, admit that this income cannot be relied upon in full. It would be more advisable as a means of averting the present financial danger to expose the deficit to the people and thus appeal to their aid in rendering relief to the situation, than it would be to manipulate imaginary figures, regardless of facts, in order to cover over the deficiency. Thus, the revised Budget provides only $15,000,000 for domestic loans and correspondingly reduces the total amount of receipts.

"With regard to the other items, the receipts from land tax have been increased by abou $3,522,000; the customs duties, by about $4,246,000; the salt gabelle, by about $953,000; the likin, by about $503,000; the general and other taxes, by about $671,000; the general and other fees, by about $258,000; and the sundry receipts, by about $7,958,000, making a total increase of $18,111,000. As a matter of fact, this increase cannot offset the amount by which the receipts under the Domestic Loans have been reduced. Though the separate items of receipts have been increased, yet their total in the Budget represents a smaller figure. This is the explanation for the reduction in the annual receipts.

"Regarding the figures given in the schedule of expenditure of the original Budget, the item for loans also takes up the greatest portion, amounting to nearly one-half of the annual expenditure. This item consists of payments

on account of foreign loans for this year of about $131,600,000; payment of foreign indemnities for the last year entered as arrears for the present year of about $10,300,000; the redemption of loans paid from the "Re-organization Loan" of about $107,800,000; payment for the redemption of short term loans of the central government within this year of about $3,8000,000; payment for the redemption of Domestic loans of about $47,100,000. Excepting the payment of foreign long term loans of about $50,000,000; for indemnities of about $30,000,000, and for Domestic loans of about $8,000,000; the remaining items of expenditure are all for the special expenses of this year.

"The next item in the order of importance is that of military expenditure. In the original Budget, the expenditure estimated for military affairs was given at about $130,000,000 and for the disbandment of troops at about $27,000,000, making a total of $160,000,000. At first, we attempted to strictly reduce this expenditure, but owing to the sudden outbreak of the second revolution, the policy of disbanding the existing troops could not be put into effect, and, in addition to this, the expenses for recruiting had to be increased. Thus in the revised schedule prepared by the Board of Army, the expenditure has been increased by about $2,100,000 as compared with the amount originally estimated. Furthermore, the expenditure for the internal administration of the provinces had increased as a natural result of the disturbance and in order to preserve the peace of the localities, additional land and river police forces were formed, and, funds for charitable purposes had to be contributed to relieve the people in the disturbed districts. So that the estimated expenditure of the Board of Home Affairs, has correspondingly increased.

"With regard to the expenditure of the different Boards the expenses for the Board of Foreign Affairs have been reduced by about $518,000; the Board of Finance, by about $3,800,000; of the Board of Law, by about $3,846,000; the Board of Education, by about $237,000; the Board of Agriculture and Commerce (which is an amalgamation of the Board of Agriculture and Forestry and the Board of Industry and Commerce), by about $1,838,000, and that of the Navy, by about $10,000. Excepting the Board of Communications whose expenses have been slightly increased for providing an increase in the railway police service, the total amount of expenses of the Boards has been decreased by about $10,240,000.

Taking the expenditure as a whole, the amount of expenses curtailed under the different Boards may equalise the amounts increased for the Board of Home Affairs and the Board of Army. This is the explanation for the reduction in the expenditure.

"In balancing the annual receipts and expenditures, there is a deficit of $84,940,731. To devise some means of meeting this deficiency is, of course, the duty of this Board, but as the deficit shown in the Budget, is a matter of assumption and the balance between the revenue and expenditure is based upon a theoretical calculation, it is earnestly hoped that all the officers will adhere strictly to the policy of limiting the expenditure to the revenue, or, in other words, to maintain an equal balance between the expenses and the receipts, so that, in this way, the finances of this country may gradually be improved."

Total Receipts	$557,296,145.
" Expenditure	642,236,876.
Total Deficit	$ 84,940,731.

ANNUAL REVENUE

Ordinary

Land Tax.

1 Land (and Poll) tax	$57,813,927	
2 Grain tribute commuted	16,732,771	
3 Ground rents	3,244,556	
4 Miscellaneous	1,389,468	
		$79,180,722

Salt Gabelle.

1 Salt Tax and Likin	39,758,706	
2 Surtax	22,622,419	
3 Miscellaneous	1,918,820	
4 Receipts from Government transportation service	298,889	
5 Additional Surtax	578,454	
6 Sundry	2,681,088	
7 Additional duties	888,835	
7 Profits	7,586,890	
9 Sale of Merchants Licences	1,067,164	
		77,401,265

Customs.

1 Native Customs	9,728,832	
2 Maritime Customs	57,241,171	
		66,970,003

Likin.

1 General Likin	22,906,670	
2 Consolidated tax (T'ung Chüan)	4,118,236	
3 Miscellaneous Likin	5,679,900	
		32,704,806

General and Miscellaneous Taxes.

1 Title deed tax	12,223,184	
2 Pawnshop tax	660,394	
3 Tobacco, spirit and sugar tax	10,250,842	
4 Mining tax	1,709,238	
5 Brokers' tax	621,003	
6 Tea tax	666,229	
7 Stamp tax	980,000	
8 Income tax	2,175,000	
9 Tobacco and spirit licence tax	2,175,000	
10 Consolidated tax	4,070,174	
11 Fishmongers' tax	141,320	
12 Sundry	2,189,776	
		37,862,160

General and Miscellaneous Licence Fees.

1 Tobacco and spirit licence fees	1,745,561	
2 Brokers' licence fees	59,415	
3 General licence fees	305,084	
4 Pawnshop licence fees	145,471	
5 Sundry	1,555,641	
		3,811,172

Receipts from Government enterprises.

1 Income from Government enterprises	7,050,207	
2 Interest on Government investments	799,405	
		7,849,612

Miscellaneous Receipts.

1 Legal fees	6,650,027	
2 Interest on public moneys (Government funds)	767,363	
3 Collection fees	863,571	
4 Sundry receipts	4,104,852	
		12,385,813

Total Ordinary Annual Revenue $318,165,553

Extraordinary

Land Tax.

1 Sale of waste lands	$ 1,822,055	
2 Colonization (K'en Wu)	138,976	
3 Miscellaneous	1,261,857	
		$ 3,222,888

Salt Gabelle.

1 Salt tax	2,162	
2 Fines	8,065	
3 Miscellaneous	154,042	
		164,269

Customs.

1 Native Customs	1,026,847	
2 Maritime Customs	227,433	
		1,254,280

Likin.

1 Fines	3,214	
2 General Likin	2,166	
3 Miscellaneous	674	
		6,054

General and Miscellaneous Taxes.

1. Sundry taxes	417	
		417

General and Miscellaneous Licence Fees.

1 Brokers' Licence fees	33,412	
2 Pawnshop Licence fees	99,000	
		132,412

Receipts from Government enterprises.

1 Income from Government enterprises	634,093	
		634,093

Miscellaneous Receipts.

1 Disposal of public properties	2,353,559	
2 Refund of public moneys	170,479	
3 Fines	1,438,236	
4 Interest on public moneys	353,841	
5 Collection fees	512	
6 Sundry receipts	352,765	
7 Title Deed registration fees	5,446,475	
		10,115,867

Contributions.

1 Contributions from official emoluments (Pao Hsiao)	97,494	
2 Compulsory contributions (Chin Tieh)	1,238	
3 Public contributions (Kuo Min Chüan)	131,576	
		230,308

Loans.

1 Foreign Loans	208,370,000	
2 Domestic Loans	15,000,000	
		223,370,000

Total Extraordinary Annual Revenue $239,130,592

Total of Ordinary and Extraordinary Annual Revenue $557,296,145

ANNUAL EXPENDITURE

Ordinary

Under the Board of Foreign Affairs.

1 The Board proper	$ 585,196	
2 Legations abroad	1,857,900	
3 School of Russian Language	42,204	
4 Provincial Expenditure	807,815	
		3,293,115

Under the Board of Home Affairs.

1 The Board proper	578,559	
2 Offices in Peking	3,469,096	
3 Provincial Civil Administrators' offices	4,733,124	
4 Intendants' offices	2,385,067	
5 Magistrates offices	16,965,608	
6 Police in provincial Capitals and treaty ports and marts (including police subsidies)	2,799,275	
7 River police in the provinces	5,782,373	
8 Treaty ports and various construction works	2,244,462	
9 Ritual ceremonies in the provinces	12,880	
10 Agricultural settlements and inspection of Government and private lands in the provinces	133,890	
11 Pacification and arrests of criminals in the provinces	184,524	
12 Sanitary, charitable and other expenses in the provinces	155,721	
13 Relief expenses on frontiers	173,570	
		39,618,149

Under the Board of Finance.

1 The Board proper and offices under its direct control... ...	774,860	
2 Offices in Peking ...	6,996,099	
3 Salt Administration	8,271,778	
4 Shui-wu Ch'u and Maritime Customs	8,536,293	
5 Native Customs ...	1,114,366	
6 Imperial pensions...	6,000,000	
7 Allowance to Bannermen and Ching Tombs	9,633,970	
8 Provincial expenses	11,265,878	
9 Public loans	151,751,036	
10 Reserve fund ...	6,000,000	
		210,345,180

Under the Board of Education.

1 The Board proper	871,946	
2 Schools under the direct control of the Board	1,348,938	
3 Subsidiary offices under the Board ...	271,862	
4 Students abroad sent by the Board	341,499	
5 Supplementary expenses	1,302,130	
6 Provincial Expenditure	1,070,840	
		5,207,215

Under the Board of Army.

1 The Board proper and offices under its direct control... ...	35,953,830	
2 General Staff office and offices under its direct control ...	1,684,871	
3 Military expenses in the provinces ...	91,640,781	
4 Military expenses on the frontiers ...	7,585,012	
		136,864,494

Under the Board of Navy.

1 The Board proper and offices under its direct control... ...	7,088,051	
2 Naval expenses in the provinces... ...	577,830	
		7,665,881

Under the Board of Law.

1 The Board proper... $	445,627	
2 Offices in Peking ...	945,489	
3 Judicial expenses in the provinces	13,280,709	
		14,671,825

Under the Board of Agriculture and Commerce.

1 The Board proper and offices under its direct control... ...	4,094,058	
2 Provincial Expenditure	989,328	
		5,083,386

Under the Board of Communications.

1 The Board proper and offices under its direct control... ...	930,616	
2 Provincial Expenditure	4,261	
		934,877
Total Ordinary Annual Expenditure		$423,684,122

EXTRAORDINARY

Under the Board of Foreign Affairs.

1 The Board proper... $	196,800	
2 Legations abroad ...	629,000	
3 School of Russian language	870	
4 Provincial Expenditure	186,553	
		1,013,223

Under the Board of Home Affairs.

1 The Board proper...	966,063	
2 Offices in Peking ...	582,501	
3 River police in the provinces...	405,954	
4 Buildings and constructions in the provinces...	1,662,762	
5 Investigations in provinces...	228,176	
6 Charity expenses in the provinces	53,750	
7 Expenses for prohibition of opium-smoking in the provinces	87,540	
8 Pacification and sundry expenses in the provinces...	277,114	
		4,263,860

Under the Board of Finance.

1 The Board proper and offices under its direct control... ...	257,615	
2 Offices in Peking ...	963,905	
3 Salt administration	20,841,671	
4 Maritime Customs	2,306,975	
5 Native Customs ...	19,407	
6 Bureau of Printing	669,375	
7 Special expenses provided for in the annexes of the Reorganization Loan contract	7,084,392	
8 Provincial expenditure	438,803	
9 Public loans	148,986,471	
		181,568,614

Under the Board of Education.

1 The Board proper... $	25,000	
2 Schools under the direct control of the Board	1,380,675	
3 Subsidiary offices under the Board ...	182,400	
4 Students abroad sent by the Board	54,580	
5 Provincial expenditure	58,980	
		1,701,635

Under the Board of Army.

1 The Board proper and offices under its direct control... ...	19,839,921	
2 The General staff office and offices under its direct control	505,747	
3 Military expenses in the provinces ...	4,713,974	
4 Military expenses on the frontiers	1,850,876	
		26,910,518

Under the Board of Navy.

1 The Board proper and offices under its district control ...	1,307,014	
		1,307,014

Under the Board of Law.

1 The Board proper...	279,012	
2 Offices in Peking ...	74,900	
3 Judicial expenses in the provinces	16,400	
		370,312

Under the Board of Agriculture and Commerce.

1 The Board proper and offices under its direct control... ...	569,570	
2 Provincial expenditure	390,165	
		959,735

Under the Board of Communications.

1 The Board proper and offices under its direct control ...	119,960	
2 Provincial expenditure	337,983	
		457,843
Total extraordinary annual expenditure		$218,552,754
Total of Ordinary and Ex-extraordinary Annual Expenditure		$642,236,876

RAILWAY PASSENGER TAX IN CHINA*

[By Ching-Chun Wang, Ph.B. in C.E., Ph.D., Vice-Chairman of the Commission on the Unification of Railway Accounts and Statistics.]

Recently we have heard a good deal in connection with the announcement that China intended to follow the example of England, Germany, and other European nations in imposing a tax on railway tickets. That is, when a passenger buys his ticket he will be required to pay an extra charge equal to about 5 to 15 cent. of the fare. While admitting the necessity of securing revenue from every possible source in order to ameliorate the present financial stringency, and putting aside the political questions involved in such a matter, we propose to examine the question of imposing such taxes on railway tickets from a railway and economic point of view. In so far as what China intends to do in imposing such a tax is to follow the example of the West, we may, first of all, examine under what conditions and in what spirit some of the Western nations actually impose that tax.

Beginning with England, we find it has been imposing such taxes on railway passengers for years. During the early part of the 19th Century, when the principal means of land transportation was the stage coach, duties were levied on passengers for various purposes. When railways were invented, in the early part of the last century, they were placed under the same category as the highways and stage-coaches, and accordingly the existing laws of levying duties on passengers were made to apply to this new means of transportation.

The first law governing the imposition of duties on railway passengers, was passed in the reign of William the Fourth. This Act was repealed in 1842, and a new law passed (5 & 6 Vict. Cap. 79), which provided that a duty of 5% should be levied upon all sums received for the conveyance of passengers and that the proprietors of the railways were held responsible under penalty, for the proper payment of these duties.

In 1844, another law was enacted (7 & 8 V. C 85 S 9) which provided that no tax should be levied upon the receipts of any railway company for the conveyance of passengers at fares not exceeding one penny per mile. This act was amended in 1863 (26 & 27 Vict. C. 33). It was amended again in 1883 by the Cheap Trains Act (46 & 47 Vict. 34), which provided that fares not exceeding the rate of one penny per mile should be exempt from all duty and that the duty on fares exceeding the rate of one penny per mile, for conveyance of passengers between stations within one urban district, was reduced to 2%.

Briefly, the above is the development of the law in Great Britain governing passenger duties. The railways in fixing their fares constantly keep in mind these impositions. The Government, however, gets very little from this source of taxation. Taking 1911 as an example, while the gross passenger receipts were about £53,000,000, the total passenger duty collected amounted only to about £300,000, which is about one-half per cent. of the gross receipts. This is due to the fact that on account of sharp competition and in order to develop the passenger traffic, the British railways have so reduced their fares that practically

*Substance of a memorandum submitted to the China Railway Association, by Dr. C. C. Wang at the request of that organization.

only first class traffic is now liable to this tax. As the great majority of the people travel 3rd class and the gross receipts from 1st class traffic are comparatively insignificant, this tax is becoming nominal. Thus out of a total number of 1,326,316,990 passengers carried by the railways in 1911, only about 30 million, or less than 2.5%, were 1st class passengers. In other words, the British Government only tax a very small fraction of her well-to-do travellers, who do not mind paying for extraordinary luxury or "dignity," while the great majority of the people are exempt from this duty by travelling 3rd class. It must be pointed out here, however, that the 3rd class accommodations and facilities in England compare favourably with those of many 1st class carriages in the East.

On account of the fact, that the people in Ireland are financially less favourably situated than the people in England and Scotland, and that in order to avoid running the risk of arresting the necessary amount of travel in that island, as well as for some other reasons, the British Government decided from the beginning to exempt Ireland from all these duties.

From the above, it may be seen that this tax has not only failed to bring to the British Government the expected amount of revenue, but also has proved very unpopular. In fact, I am authoritatively informed that there is a movement on foot to abolish the duty entirely, and those who are familiar with British railway affairs know that the work of the Travelling Tax Abolition Committee and other organizations, whose object it is to hasten the unconditional abolition of railway passenger duty, is making much progress.

Turning to Germany, we find similar results as in Great Britain. Of all the nations which have State railways, Germany is acknowledged to be the most successful. In Germany the "Imperial Ticket Tax," as duties on passengers are called, ranges from about two per cent. on tickets of the 3rd class to something like 15% on long distance tickets of the 1st class. The 4th class, however, is exempt from this duty, thus making the higher classes pay more. As to the result of the experiment, I cannot do any better than to repeat what a German railway authority, with much personal experience and knowledge about this tax, once wrote to me. This gentleman stated that taxes are nowhere popular, but no tax has been so unfavourably received in Germany as that on railway tickets. Soon after the introduction of this form of taxation, a popular movement was made to obstruct it. To show their opposition, the people organized many societies for the special purpose of defeating the law. A rush was set in, and higher class travelling went to lower classes. As a matter of fact, 1st class paying passengers are now almost unknown in Germany, and 2nd class travelling shows a great decrease, while 3rd class travelling has extended very much. More than that, the 4th class, which formerly was only patronized by the labouring people "is now crowded," to quote the exact words, "by passengers of all standing." This change of habit to travel by lower classes, besides reducing railway revenue, has affected the receipts of the ticket tax, which in 1906 were about $3,000,000 less than estimated.

As the railways are owned and operated by the State, and all receipts, whether in the form of duty or fares, ultimately go into the State Treasury, the net result of this imposition of duty and decrease in railway revenue must be obvious. Thus not only the Government's expectations from the tax are not fulfilled, but it has to bear considerable losses in the actual fares, to say nothing of the irritation which the tax has produced among the people. As a result of their experience, both the Government and Parliament are planning, we understand, to abolish this tax at an early date.

From this brief sketch of the development and spirit of the application of the law concerning passenger duty in Great Britain and Germany, we may see that the fundamental principal underlying the whole question of passenger duty in these two countries is, on the one hand, to tax those who want to travel with exceptional luxury, with whom a duty of 5 or 10 per cent. on the fare does not enter into much consideration, while on the other hand, to exempt from this duty the average people who need to travel and who call only for comfort and convenience rather than luxury. As the writer is requested only to find out what these three countries are doing in this respect and under what conditions it is done, he will not give any opinion as to whether China should follow the example of Germany and Great Britain to introduce this form of taxation or to follow America in avoiding it, because he feels that in this matter as well as in many other things, indiscriminate copying or imitation is often dangerous. He wishes to emphasize, however, that should China decide to follow the example of Great Britain and Germany in introducing this duty, she cannot over-emphasize the fact that she should also constantly keep in mind the spirit of the British law and the practice of the German Government, in taking into consideration the paying capacity and the urgent need of more travel of the people, so that the middle and poorer classes, who have already more than their handsful in carrying on their uphill struggle, may be exempt from this additional burden.

Furthermore, the fact that there are such active movements in both Germany and Great Britain, in favour of the abolition of this duty after considerable trial, also reminds us to be especially careful not to introduce a foreign institution which may soon be discarded by its originators.

It must also be pointed out that the general rise in fares which will naturally follow the indroduction of the duty will have two effects. First, it will reduce or "kill" what is called pleasure travel; secondly, where the general level of fares is comparatively high, and where there is more than one class of service, as in China, such a general rise in fares is likely to lead people to avail themselves of the lower classes, as actually took place in Germany. Insofar as we have practically no pleasure travel, we have not much fear from the first effect. From the second effect, probably we cannot escape, and the net result will probably be that the total receipts from both fares and duties after the imposition of the tax will not very much exceed the former normal receipts from fares alone. The only difference will be that more people will crowd into the crowded third class, which certainly is a condition to be avoided. Indeed, it is worth while to-day to consider whether it is advisable to lower the standard of travel of the people.

This leads us to conclude, that after all the advisability or otherwise of the imposition of such a duty, when considered from an economic point of view, largely depends upon two factors, i.e.—the existing level of fares and the comparative paying capacity of the people. We, therefore, give a table which contains the approximate figures of the average fares for the different classes in various foreign countries: (*See table I. next column*).

From this table it may be seen that by casting aside the differences in accommodation and in the purchasing power of the dollar, &c., the class fares in China are only a little less than in France, Belgium and England, while they are considerable higher than in all other counties cited in the table. Moreover, in the case of the 2nd and 3rd class fares, ours are about 40 per cent higher than those of Japan, and more than double of India. Insofar as the travelling conditions and earning capacity of our people are similar to those of India and Japan, and also insofar as most of our people travel second and third class, this comparatively high level of fares must be a serious obstruction to the proper development of passenger traffic in China.

But our comparison of fares in different countries will be misleading if it is made only upon the basis of the ordinary class fares, for a great proportion of the passengers do not travel by the class fares. Excursion and numerous other exceptional fares, which are usually very much cheaper than the class fares,

TABLE I.

Country.	Approximate capital outlay of line per mile, in dollars.	Approximate average Fares per mile including ticket duty, in cents. Class 1st	2nd	3rd	4th
England	600,000	6.5	4.3	3.8	
France	356,000	6.5	4.3	2.8	
Belgium	264,000	5.6	3.8	2.3	1.5
Germany	140,000	5.3	3.4	2.3	
America	150,000	3.9			
Austria	210,000	5.0	3.0	1.7	1.3
Russia	160,000	5.0	3.0	2.2	
Japan	86,000	4.6	2.7	1.5	
India	90,000	4.2	1.8	0.8	There is an intermediary fare between 2nd and 3rd.
China	80,000	5.4	2.6	2.0	

and which are little known in China, have been developed so extensively in many foreign countries during recent years, that the average fare actually paid by the ordinary traveller is usually much below the class fares.

Beginning with England, we hear much of the "penny-a-mile" 3rd class fare. But many people overlook, or are ignorant of the fact, that these class fares are conspicuous only by their absence. Indeed, competition has been felt so keenly by the railways in England, that these class fares are adopted only in rare cases, while the great bulk of travellers go by reduced fares.

To show the nature of these reduced fares we may take the 3rd class excursion day fare of 3/- from Manchester to Blackpool, as an example. The distance is 49 miles, which makes the return trip 98 miles. The ordinary class fare is about 8/- or four cents per mile, while the excursion fare gives the passenger the privilege of travelling at a trifle over 1.3 cents per mile by some of the best trains of the World, every day in the year. The Great Central Railway Company, which is know as a go-ahead concern, has recently introduced the attractive fare of 3/3d from Manchester to Cleithorpes, a distance of 103 miles in each direction, which represents about 0.8 cent per mile and which has attracted a great many people to travel between these places. In addition, there are the numerous half-day and day excursion fares, short period tickets, short and long date week-end excursions, long distance excursion fares, picnic and pleasure-party fares season tickets, surburban coupons, &c., &c., each of which means reduced fares.

These examples are by no means exceptional cases. In fact similarly low fares are in use over all the lines, and it is by these low fares that a great portion of the passengers are carried and the dense passenger traffic in England is built up.

Belgium—What is true in England is similarly true in many other countries. Thus comparing our fares with those of Belgium, we must first of all point out that the Belgian fares are fixed on the zone or tapering basis, that is the longer the distance the less the fare per mile. On the surface, we notice our class fares are a little lower than those in Belgium. But in this case, as it is in that of Great Britain, we must say that such a comparison is at least incomplete if we overlook the numerous reduced fares, such as the return class fares, school tickets, tickets available for 5 or 15 days, or for 3, 6, 9 or 12 months over all the railways of Belgium, and other season and excursion tickets, all of which reduce the fares considerably below the class fares

Austria and Hungary—In Austria, the ticket-tax ranges from 6 per cent. on the "Lokalbahnen," or branch lines, to 12 per cent. on the "Hauptbahnen" or trunk lines. There is no uniform system of fixing fares, but in many cases the zone system is adopted, according to which the fares are calculated in zones of 10 kilometres; each portion of 10 kilometres being considered as 10 km., and the longer the distance the less the fare unit. Thus, while for distances from 1 to 100 miles the 1st, 2nd and 3rd class fares are 5.0, 3.0 and 1.6 cents per mile respectively; for distances over 200 kilometres, they are 4.7, 2.7 and 1.3 cents per mile, while for distances over 400 miles, they are 4.4, 2.6 and 1.1 cents per mile respectively.

In Hungary, the ticket tax also ranges from 6 per cent. to 12 per cent. Like in Austria, the fares are mostly on the zone basis. The distances are divided from each station into specific zones, within which, in the fixing of fares, each dtstance up to the limit of the zone is calculated. The first 50 kilometres, is divided into five zones of 10 kilometres., each, the next 30 kilometres into 2 zones of 15 kilometres each, the next 20 kilometres forms one zone by itself, and the next 100 kilometres is again subdivided into four zones of 25 kilometres each, thus the first 200 kilometres, is divided into twelve zones of different sizes, beyond which distances are divided into zones of 50 kilometres each. The fares are also similar to, but lower than, those of Austria, being less for the longer distances.

India.—In India, the Government, with the help of a technical staff and with the advice of the Railway Conference Association, fixes the maximum and minimum fares. The practice there has been to encourage traffic by low fares, as shown by the figures in the previous table, and the result has given every satisfaction. Since the introduction of the low fares in 1884, the number of passengers has increased almost three-fold, while the total amount of receipts has more than doubled itself. These results certainly commend themselves to the serious consideration of railway administrators.

From the above it may be seen how misleading it will be, if we simply compare the ordinary class fares and overlook the real traffic conditions in the different countries. And it is safe to say that when we take these reduced fares into consideration, we shall find that fares in China are not any lower than in France and England and that they are considerably higher than in, Germany, the United States, and many other countries.

In comparing the fares of the different countries, besides taking the special fares and difference in traffic conditions of the different countries into consideration, we shall also keep in mind the differences in the purchasing power of money in these countries. A dollar, if we take it as the unit of comparison and as being equal to fifty cents U. S. Gold, two German marks or two shillings of English money, generally speaking can purchase about three times as much in China as it can in Europe or America; that is, if we can purchase three dozen eggs, or three pounds of beef in the United States with one dollar, we shall be able to buy about nine dozen eggs or nine pounds of beef in China. In other words, what costs three dollars in Europe or America should cost us no more than one dollar here. In so far, as railway transportation is but a commodity for sale by the railways, to be purchased by the travellers, then if a mile costs three cents in Europe or America, it should cost no more than one cent in China. Thus in comparing the different fares or rates, it is not the dollar itself, but the purchasing power of the dollar that forms the proper unit or basis of comparison. Since this is so, although the two cent per mile, third class fare in China as set forth in the above table, is 0.8 of a cent less than that in France and 1.9 cents less than in England when measured by the dollar, it really is almost three times as high as those in the two countries mentioned if it is properly measured by the purchasing power of the dollar. To this difference of the purchasing power of the dollar in China and elsewhere, if we add the difference of the earning or paying capacity of the people, we can readily see that the difference between our fares and those in Europe and America is enormous and that if we experiment with any changes of our railway fares at all, we should unquestionably lower them first rather than raise them. In so far, as the reducing of fares invariably increases the amount of traffic, the experiment of lowering our fares may not necessarily result in the decrease of our net railway receipts, in which case it will mean the net beneficial result of having more people enjoy the advantages of travel with the same net returns to our treasury. On the contrary, if properly managed, a proper reduction of fares may even bring more net revenue to the railways, as has often been the case elsewhere. Then again, it is clear, that when the economic and social conditions of the average people are taken into consideration, our fares should not be based upon the existing fares in England or France, where the purchasing power of the dollar and the earning or paying capacity of the people are so different from ours, but rather be guided somewhat by the fares in India and Japan, where economic and operating conditions are more similar; or perhaps better still, to strike a middle course between the two extreme cases instead of following either.

This, of course, leads to the question of considering the fares from a proprietary point of view; that is the Government or the companies as owners of the railways, have a right to charge a fare which will bring to them a reasonable return on the amount of money, which they, as proprietors, put into the railways. In this case, besides taking the rate of interest on the investment the usual way of comparison, is to take the cost per mile of line as a basis. By referring to the first column of figures in the previous table, we may see that the capital outlay per mile in China is considerably less than in Europe or America and hence the fares should also be less. Moreover, if the proprietors may make fares by using the cost of the line as a basis, the passengers may also use the fares as a basis for demanding travelling facilities and accommodation. If we consider the question from the latter point of view, and since our first class accommodation is not much better than foreign second class facilities, and our second class is certainly worse than foreign third class, the travellers may say that we should compare our first class with foreign second class and our second class with their third class fares and not the corresponding classes.

We must also add, that in the administration of railways, especially where the State furnishes the capital, the Government should constantly bear in mind that on the one hand the railways do not lose any revenue by quoting unduly low rates and on the other hand the public is not oppressed by too high charges so as to arrest the necessary development of industry and commerce. In so far as China is the only country which has no law for the regulation of rates and fares, it becomes important that the whole situation, especially the paying capacity of the people and the existing comparatively high rates, should be taken into careful consideration, before introducing such a tax at the risk of arresting traffic development.

When we take the foregoing facts into consideration and notice that such a tax will not bring much revenue, as shown by the experience of other countries imposing such a tax; that there is a great need of development of passenger traffic in China, and that there are constant quarrels between the station masters and the travellers on account of making the small changes of money in the purchase of tickets, which fact is well known to any traveller, we doubt very much whether we should add another factor of small changes of money by imposing this tax and introduce one more factor of irritation, by making the railway authorities assume the repulsive duty of tax collectors and loading the people with the additional burden of being taxed for going about.

If the Government is earnest in its desire to get more money out of the railways it can do no better than to abolish all likin and other troublesome taxes along the railways. These barriers create much trouble for the railways and give most undesirable obstacles to the business men, while producing but little revenue for the Government. Indeed, likin, worse than all other drawbacks, is interfering most seriously with the development of traffic, and hampering domestic trade in China.

Upon the abolition of these obnoxious barriers, the Government can easily require the railways to guarantee to pay to the Government the same or even greater amounts than what are now paid by these numerous barriers. By so doing, the Government will not only be able to increase considerably its likin revenue and its railway receipts, but will also be rendering a great service to trade. Since what the merchants hate is not so much the payment of the likin charges as the trouble and unreasonable exactions which the likin collectors impose under the excuse of these charges, the abolition of these barriers and the guarantee of the likin revenue by the railways will bring considerably more revenue to the Government on the one hand and prove a boon to trade. As soon as these taxes are abolished goods traffic is bound to grow, which will again bring more prosperity to the country and more railway revenue to the Government, the net result of both of which facts will be to China's increasing advantage. By imposing the ticket tax we can get very little money and we shall be creating opposition among the people, while by abolishing likin along railways we shall be helping all people and incurring the displeasure of only the likin collectors. Instead of trying to scrape up a trifling sum of money by irritating millions of travellers and good business men, as well as discouraging trade, why not try to create a source of increasing revenue by this beneficial means? This is what the writer desires strongly to recommend to the consideration of the authorities in charge of finance and transportation.

PEKING PRINTING AND ENGRAVING BUREAU

The Bureau of Printing and Engraving at Peking has been operated for some considerable time at a loss. As the Bureau is considerably in debt to the American Bank Note Company an offer has been made by the latter to take over the Bureau. The company is willing to lease the existing machinery, instal whatever additional plant may be required and to enter into an arrangement to print the Government's bonds, notes and stamps.

EXTENSION OF THE DAIREN WATERWORKS

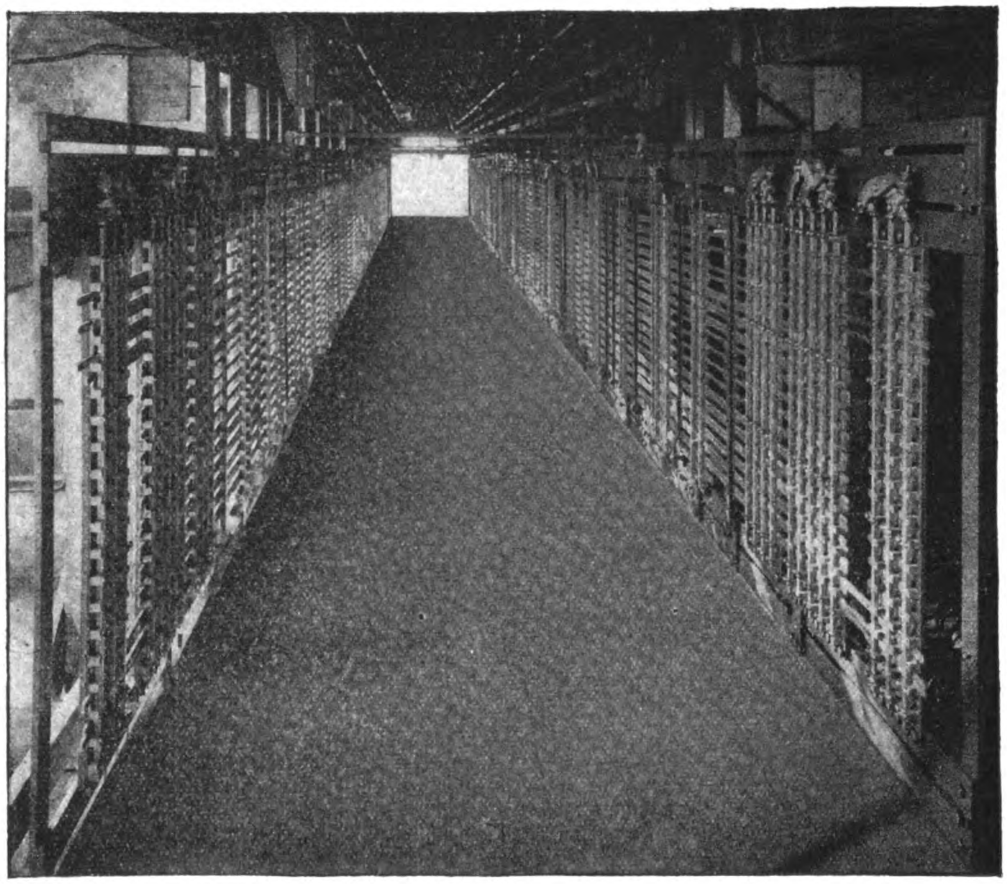
The work of laying a light rail line, about 8 miles in length, from West Shahokou to Malantun, where the water source of the city's Waterworks is situated, was started by the Japanese contractor yesterday, says the *Manchuria Daily News* of April 6. The light rail line is to be used for carrying supplies required for the extension of the equipments at the water source. These supplies will be transported from Dairen as far as West Shahokou by tramway, and will be kept at a depot to be founded there for the purpose.

The construction of the dam was to be begun early in May.

CENTRALIZED CONTROL SYSTEM FOR PANAMA CANAL LOCKS

The electrical specification, design and manufacture of the Panama Canal centralized control system may properly be regarded as one of those undertakings which, from an engineering standpoint, not only arouses a lively interest but also presents an opportunity for much valuable instruction. The interest results mainly from the immensity of the Canal project itself, and the instruction from a consideration of the methods employed to insure the passage of even the largest ships afloat across the Isthmus with speed and safety. The complete operation of the Canal locks, terminals and auxiliary equipment utilizes electrical energy throughout, with the present exception of the Panama Railroad, the electrification of which is under contemplation.

The specifications for the entire generating, lock controlling and distribution system for operating the Panama Canal were prepared under the supervision of Mr. Edward Schildhauer, Electrical & Mechanical Engineer, Isthmian Canal Commission, assisted by a staff of able electrical engineers, including Mr. C. B. Larzelere, who was closely identified with the lock control problems, and Mr. W. R. McCann with the generation and distribution of power. These specifications exhibited great care and painstaking engineering. They contained every safeguard that expert engineers could suggest, were exact and explicit in regard to the results required, yet gave proper range in the details of accomplishment.


Interlocking System below the Miraflores Board.

GENERATION AND DISTRIBUTION

The power system for the operation of the locks, towing locomotives, lights for the locks and buildings, and motors not directly connected with the lock control, is composed of:

A 7,500 kv-a, 2,200 volt hydroelectric power plant at the Gatun Dam;

A 4,500 kv-a, 2,200 volt Curtis turbo-generator electric power plant at Miraflores for emergency, lately used to supply power for construction work;

A double 44,000 volt transmission line across the Isthmus, connecting Cristobal and Balboa with the two power plants;

Four 44,000 - 2,200 volt substations, stepping down at Cristobal and Balboa, and up or down at Gatun and Miraflores, depending on which of the two plants is supplying power;

Thirty-six 2,200-240 volt transmission stations for power, traction and light at Gatun, Pedro Miguel and Miraflores locks;

Three 2,200-220-110 volt transformer stations for the control boards at the locks;

Stations at Cristobal and Balboa for coal handling plants, machine shops and dry docks.

The system of connection throughout employs a double bus, double switch scheme, with provision for disconnecting any oil switch for cleaning or repairs without interrupting the circuit. In the power house and the four 44,000-2,2000 volt substations, the oil switches are solenoid operated and are installed in concrete cells, above which are concrete fireproof compartments containing the two sets of buses. In the thirty-six transformer stations in the lock walls, the oil switches are hand operated. All 2,200 volt oil switches have disconnecting switches, so arranged that live parts are completely covered.

For the hand operated switches, a pipe framework supports vertical metal guides which carry the oil switch operating mechanism and slate base forming a section of the switchboard panel. On the guides a lever and toggle mechanism is mounted, by which the oil switch and slate base may be raised and lowered. Above the oil switch and mounted on the pipe framework a stationary cast iron base carries the disconnecting switch studs and insulators. The high tension leads run to the tops of the disconnecting switch studs, and the bottom of each stud is equipped with contact fingers. On the top of each oil switch stud is mounted a contact blade. When the oil switch is raised, these blades engage the contacts on the bottom of the disconnecting switch studs, which thus in the closed position form extensions of the oil switch studs. The disconnecting switch contacts are surrounded by insulating shields which prevent accidental contact. When the oil switch is lowered, it is completely isolated from the circuit. When the oil switch is raised, it always goes to a fixed height where it is latched. An interlock prevents the oil switch from being raised or lowered unless its contacts are open, precluding the circuit being closed or opened by the disconnecting switch. In some instances another interlock makes two single-throw switches a double-throw switch and prevents both switches being closed at the same time.

For solenoid operated switches, the same form of disconnecting switch is used; but the solenoid is stationary and the connecting mechanism to the oil switch has a vertical slotted link which allows the oil switch to be raised and lowered without being disconnected from the solenoid mechanism. A mechanical interlock prevents the raising or lowering of an oil switch while in the closed position.

The instrument and control board for the Gatun Generating Station is of natural black slate, as are all the switchboards for the power system. It is totally enclosed by means of grille work with doors at each end. The switchboards for the transmission line substations are of the vertical type, with control apparatus and mimic connections symmetrically arranged on the middle section of the panels. The rear of the board is enclosed by means of grille work with doors at each end.

POWER SUPPLY AND CONTROL PANELS FOR LOCK MACHINERY MOTORS

Current for the lock machinery and towing locomotives is transformed from the 2,200 volt system in the immediate vicinity of where it is used. There are a total of thirty-six transformer stations, for all locks, each containing duplicate 200 kv-a, 3-phase 2,200-240 volt transformers for power and one single-phase 25 kv-a. 2,200-220-110 volt transformer for lighting. The stations, normally fed from the 2,200 volt buses in the 44,000-2,200 volt substations, can also be operated from the power plants; the stations at Gatun locks from the Gatun hydroelectric station; and the stations at Miraflores and Pedro Miguel from the Miraflores emergency steam plant.

To give an idea of the number and sizes of motors to be controlled in operating the lock machinery, the following table is interesting:

Machines and Operation	Motors each Machine and H.P.	Number of Motors Gatun	Ped. M.	Mira.	Tot.	Total Horse Power
Miter gate, moving, each leaf..	1-25	40	24	28	92	2300
Miter gate, miter forcing......	1- 7	20	12	14	46	322
Fender chain, main pump......	1-70	16	16	16	48	3360
Fender chain, operating valve .	1 ½	16	16	16	48	24
Rising stem gate valve	1-40	56	24	36	116	4640
Cylindrical valve..............	1- 7	60	20	40	120	840
Guard valve....................	1-25	6	6	6	18	450
Auxiliary culvert valve........	1- 7	4	4	4	12	84
Totals....................		218	122	160	500	12020

There are many motors not included above, as, for instance, those for the spillway gates, for the hand rails on the mitering gates and for the sump pumps. The spillway gates are remote controlled from a special control board, and the control of the hand rail motors is given in connection with the discussion of mitering gates.

The motors are started and controlled by contactor panels located near them, the contactors of which handle the main motor currents. These contactors are controlled from the central control house. The smaller motors, including those for cylindrical valves, auxiliary culvert valves and miter forcing, are started by being thrown directly on the line. Two double-pole contactors are used, one for forward and one for reverse. In the case of larger motors for miter gate moving, rising stem valves and guard valves, a starting point with resistance in two legs of the three-phase circuit is provided.

In all cases the contactors are operated from the control boards—to be described later—by three wires, one for forward, one for reverse and a common return. In the case of panels having a starting point, the period during which the motor remains on the resistance is automatically controlled by a dashpot, so that the starting operation at the control house is the same, simply energizing a forward or reverse wire as the case may be. The control connections are arranged in such manner that each individual machine may be controlled locally. This arrangement provides for emergency operation should the control circuits from the central control house be out of order.

LOCATION AND OPERATION of LOCK MACHINERY

From an operating standpoint the machinery was placed below the coping of the lock walls, thus affording a clear space for manœuvering ships and protecting the apparatus from the weather without erecting numerous houses.

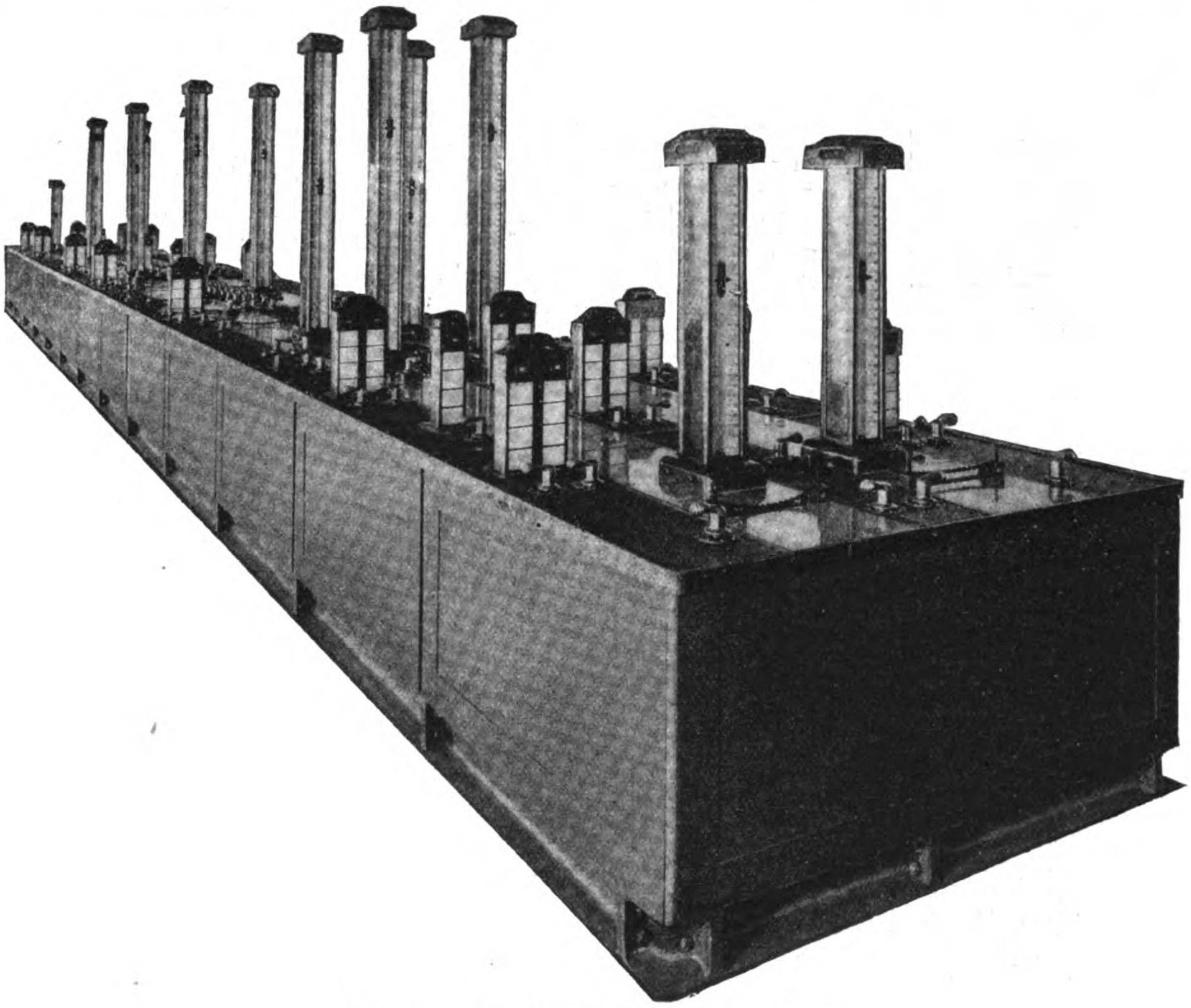
The mitering gates consist of two massive leaves pivoted on the lock walls which operate independently of each other. A pair of gates is located where each change of level occurs and divides the locks into 1,000-foot chambers. In addition to these gates, at lake and ocean ends are duplicate pairs of gates used as guard gates. To handle the vessels of various sizes with the minimum use of water, mitering gates of the same description as those above are installed, dividing 1,000-foot locks into two compartments. These gates are termed intermediate mitering gates. When the mitering gates are closed they are what might be termed clamped in this position by a device called a miter forcing machine.

On the top of all mitering gates a foot walk with hand rails is provided. When the gates are opened and in the recesses provided for them in the lock walls, these hand rails would interfere with the passing of the towing locomotives, except in the case of the lower guard gates. The hand rails are therefore made to be raised and lowered. This is done by a motor under the foot walk, controlled from the lock wall. Near the approach to each foot walk a controller is located in the lock wall flush with the surface, this controller being operated by a foot push. If the gates are closed and the hand rails are down, and it is desired to cross on the gates, the foot push is pressed and the hand rails are raised by their motors. This is true not only of the hand rails on the nearer gate leaf, but of the hand rails on the farther leaf as well. After passing across, one can, if one desires, press the foot push on the other side and both hand rails will be lowered. Or, if one leaves the hand rails up and the gates are opened by the operator in the control house, they will be automatically lowered so as to be out of the way when the gate is in the recess. When the gates are again closed, the hand rails will automatically rise again if the foot controller has been operated in the mean time. The hand rails cannot be raised when the gates are opened, and no harm results if the foot switch is operated while the gates are in the closed position.

The chain fenders are stretched across the canal in front of all mitering gates which can be exposed to the upper lock level and also in front of the guard gates at the lower end. These chains are maintained in a taut position when the gates behind are closed, and are lowered when the gates are opened for the passage of a ship. The chains are raised and lowered by a method similar to that followed in hydraulic elevators, with the additional feature that if a ship approaches the gates at a dangerous speed and rams into the chain, the chain is paid out in such a way as to gradually stop the ship before it reaches the gates. Lowering the chain for the passage of a vessel and raising it again after the vessel has passed is accomplished by two motors; one driving the main pump supplying water under pressure, and the other operating a valve which controls the direction of movement of the chain. These two operations are combined in one, each motor being stopped automatically by a limit switch when the motor has performed its function.

The filling and emptying of the locks is accomplished by three culverts, one in the middle wall and one in each side wall, the flow of water being controlled by rising stem valves. They are located in culverts at points opposite each end of each lock so that the culvert can be shut off at any desired point for filling a lock with water from above, or upstream, or for emptying it by allowing it to flow out and down to the next lock. Lateral culverts conduct the water from the main culverts, under the lock chambers, and up through openings in the lock floors.

The rising stem valves are installed in pairs, and each pair is in duplicate; also each culvert is divided into two parallel halves at these valves by a vertical wall. This arrangement reduces the size of each valve



Centralized Control Board for Miraflores Locks.

and makes it more easily operated, each valve being 8 by 18 feet. One pair of duplicates is left open as a guard, or reserve pair; the other pair is used for operating, so that in case of an obstruction in the culvert or accident to the machinery, the duplicate pair can be used.

At the upper ends of the culverts at the side walls, the duplication is accomplished by three valves in parallel, called the guard valves. They perform service exactly similar to the rising stem valves, except that three valves in parallel in this case must conform to the same laws as the two in parallel in the other case.

Mr. Edward Schildhauer, Electrical and Mechanical Engineer, Isthmian Canal Commission.

The culvert in the middle wall must serve the locks on both sides, and to control this feature cylindrical valves are placed in the lateral culverts that branch out on each side. There are ten of these on each side of the culvert at each lock.

At the upper end of each set of locks, there are two valves in the side wall for regulating the height of water between the upper gate and upper guard gate, as it is desired to maintain the level of the water between these gates at an elevation intermediate between that of the lake above and that of the upper lock when the upper lock is not at the same level as the lake. These valves are called the auxiliary culvert valves.

REASONS FOR USING THE CONTROL SYSTEM ADOPTED.

As the flight of locks at Gatun, for instance, extends over approximately 6,2co feet, and the principal operating machines are distributed over a distance of about 4,000 feet, it can be readily seen that central mechanical transmission of control of machines would be almost impossible; and to control the machines locally would mean a large operating force distributed practically along the full length of the locks, which has invariably been the practice heretofore. Such a force would be difficult to co-ordinate into an efficient operating system. The situation therefore resolved itself into centralized electrical control, which reduces the number of operators, operating expense, and liability to accident. To accomplish this system of control, a control board for each lock was constructed which permitted having all control switches located thereon mechanically interlocked so as to minimize, if not entirely prevent, the errors of human manipulations.

CENTRALIZED CONTROL AND INDICATING SYSTEM

The control boards are installed in control houses located on the middle walls at points which afford the best view of the locks, although this view is not depended on to know the position of the gates or other apparatus, as all are provided with indicators on the control board. The control boards are made approximately operating miniatures of the locks themselves, and are arranged with indicating devices which will always show the position of valves, lock gates, chains and water levels in the various lock chambers; and with the exception of such machinery as needs only an "open" or "closed" indication, the indications will be synchronous with the movement of the lock machinery.

For such indication, appliances with commutators, multiple contacts or ratchet mechanisms would not be suitable because of the many contacts and small pieces in their construction; and particularly because devices of this character move step by step and would not indicate all points in the movement of the main machinery, such indications being more or less approximate to the number of steps in the indicating devices. The indicators on the Panama control boards were developed especially for this undertaking, and show accurately and synchronously every movement of the machinery to which they are connected, whether in the extremes of travel or at any intermediate point.

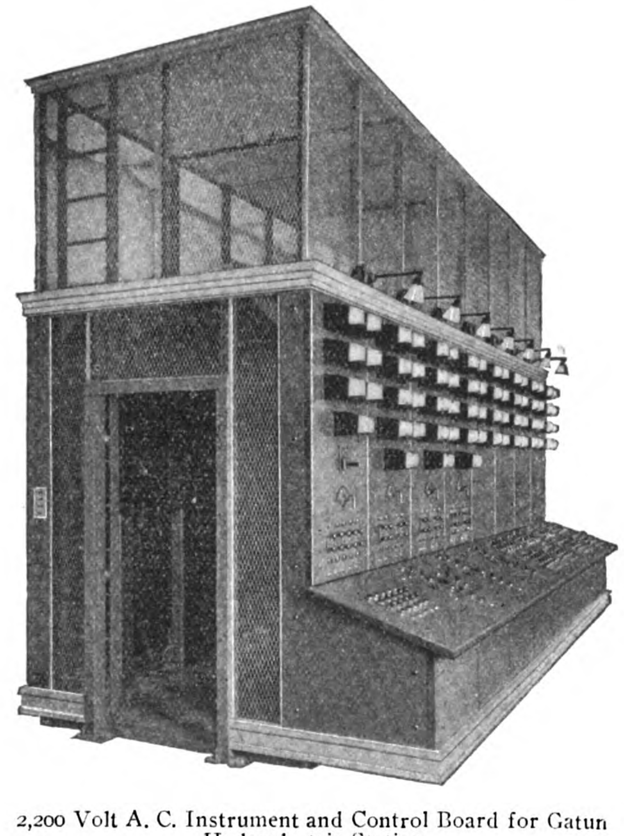
A complete synchronous indicator consists of a transmitter located at and operated by the machine in the lock wall, and a receiver operating an indicator at the switchboard in the control house. Both transmitter and receiver have a stationary and a rotating part. The stators have three-phase windings with leads from three corresponding equidistant points brought out and connected together, but not connected to a source of power, the stator coils being energized by induction from the rotors. The rotors are bipolar and are connected in multiple and energized from a 110 volt 25 cycle single-phase source.

The movement of the lock machinery and with it the connected transmitter rotor produces a field in the transmitter stator polarized in the direction of the rotor axis, which induces voltage in the stator coils. This voltage is transmitted by the three-phase connection above mentioned to the receiver stator coils and duplicates in them but in the reverse direction, the same conditions of polarity and voltage as present in the transmitter. The rotor of the receiver being energized by the external source in the same direction as that of the transmitter, is reacted upon by the polarized receiver stator until the magnetic axes coincide and the rotors of both transmitter and receiver are in the same relative position. Any difference in the position of the transmitter and receiver rotors causes a difference of potential between the stator windings with a consequent flow of current and resultant torque, which again moves the receiver rotor to the same relative position as that of the transmitter rotor. The receiver rotor follows closely and smoothly the movement of the transmitter rotor, and consequently imparts to the position indicator a movement identical with the movement of the lock machine, although on a scale reduced to the requirements of the control board. A brief description of the individual synchronous indicators follows.

In the case of the mitering gates, the vertical operating shaft is connected to a shaft which operates the transmitter machine. The latter shaft is threaded and carries a nut on which is mounted a rack. The rack engages a gear on the rotor shaft, and this turns the rotor as the gates operate. The mitering gate indicator comprises a pair of aluminum leaves, shaped to correspond to the plan view of the top of the gate, which travel horizontally just above the top of the board, the hinge ends being connected to shafts extending down through the surface of the board where they are geared to the receivers by means of bevel gears. When the miniature gates are completely opened, they are covered by shields to give the effect of the gates folding back into recesses in the lock walls.

For the chain fender, the position indicator transmitter is driven by the shaft which operates the limit switch that controls the stroke of the piston. The indication on the board is given by a small aluminum chain, which, like the large chain, is raised and lowered, each end operating independently, the large chain being lowered to the bottom of the lock and the small chain into a slot on the control board. The ends of the miniature chain are fastened to semaphore arms which are connected to segmental gears meshing with the driving gears on the receiver machines. As the receiver rotors turn, the chain is either lifted or lowered, the position of the large chain from the bottom of the lock being indicated by the angle of the semaphore arms.

As the rising stem valves occur in pairs, their position indicator machines occur in pairs also. The transmitter rotor is driven by a shaft and gearing similar to that described for the mitering gates. Each indicator is similar to a small elevator, a car being used to indicate the position of the valve gate. Both front and back of the shaft is fitted with opal glass marked with black lines for the ¼, ½ and ¾ positions. A small aluminum cage moves up and down in each compartment. A drum for operating the cord which raises and lowers the cage is located underneath the control board and is operated by the receiver through a suitable train of gears. To make the indications visible from points up and down the control board, the elevator shaft under each car is always illuminated and the portion above is dark.



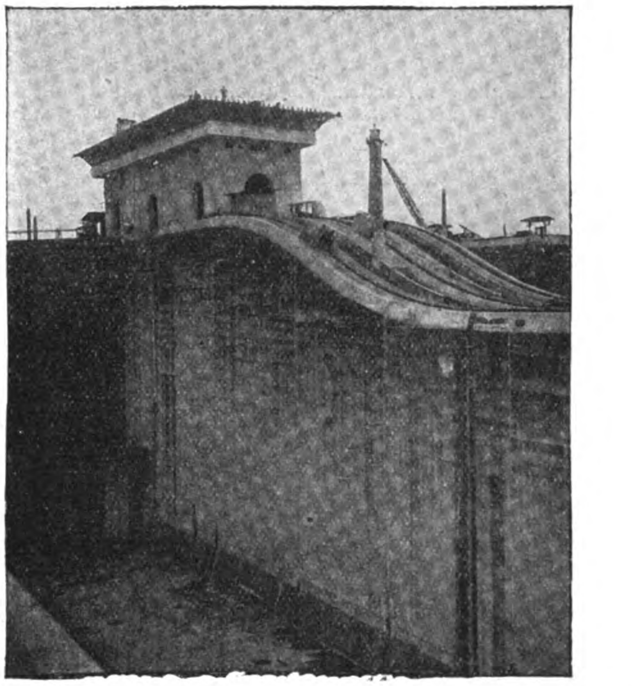
2,200 Volt A. C. Instrument and Control Board for Gatun Hydroelectric Station.

WATER LEVEL INDICATORS

The specifications covering the water level indication required an accuracy of 1/20 of a foot or 1/10 of 1 per cent. in actual water level. In the transmitters and receivers for the machines described previously, the

rotors turn less than 180 degrees with an inherent lag of 1½ per cent. between transmitter and receiver rotors in this distance, which obviously prevents this arrangement from being employed to give the water level indication.

It was found that if the rotors were revolved ten complete revolutions, the required accuracy could be obtained: but since this arrangement makes it possible for the rotors to be in synchronism every 180 degrees, or in twenty different positions for the entire travel, the indicators would not indicate correctly if for some reason the transmitter rotors were turned more than ½ revolution with the power off. Therefore, the required accuracy was obtained by two sets of transmitters and receivers, one set connected to a fine index in which the rotors make ten complete revolutions and the other set connected to a coarse index operating less than 180 degrees.



Control House at Gatun where Lock Control Board is Installed.

The fine index is a hollow cylinder carrying a pointer, the length of the cylinder being such that when an aluminum ball representing the coarse index, which can be depended upon for coarse indication, is within the limits of the cylinder, the reading of the fine index is correct within the limits specified. The scales are illuminated by lamps in both base and top caps of the indicator.

For water level indication, wells 36 inches square in the lock walls with communication to the lock by a small opening at the bottom of the well to dampen surges contain a welded steel box float, 30 inches square by 9 inches deep. A non-slipping phosphor bronze belt transmits the movement of the float to a sheave fitted with pins on the transmitter mechanism, the pins registering with holes punched in the belt. The sheave shaft is carried in ball bearings with oil cups for lubrication and drainage cocks at the bottom of the bearings.

The position of the miter forcing machine is not indicated by synchronous indicators, but its open and closed positions are shown by red and green lights and a mechanical indicator on the control board representing the machine.

CONTROL BOARDS REPRESENT LOCKS IN MINIATURE

The control boards are of the flat top benchboard type, 32 inches high by 54 inches wide, built in sections, with total lengths as follows:—

Gatun	64 feet
Pedro Miguel	36 „
Miraflores	52 „

The side and center walls of the locks are represented by cast iron plates and the water in the locks by blue Vermont marble slabs. The outer edge of the board is surrounded by a brass trim rail, and the sides are enclosed with steel plates which can be readily removed for inspection of the board. The control board is supported by a wrought iron framework resting on base castings, which are in turn supported on the operating floor of the control house.

The control switch handles are mounted above the surface of the board and operate through an angle of 90 degrees. They are provided with namoplates for the "open," "closed" and "off" positions. The space immediately below the flat top of the control board is occupied by the contact fingers of the control switches, mounted on the operating shaft, synchronous receivers and their cable connections. Connection boards are provided for the cables, which are led up from each side, as are buses for supplying current to the control switches, receivers and the lamps that illuminate the scales of indicators. The receivers, transmitters and lamps are operated at 110 volts, while the control circuits are 220 volts, both using 25 cycle alternating current.

MECHANICAL INTERLOCKING SYSTEM

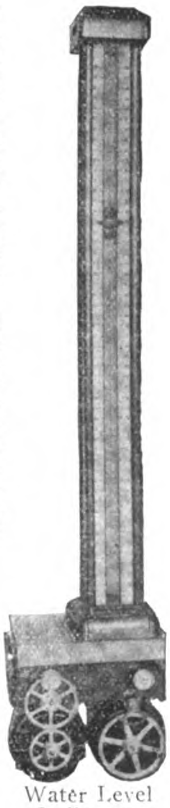
In order to make it necessary for the operator to manœuver the control switch handles always in a certain order, corresponding to a predetermined sequence of operation of the lock machinery, and to prevent the operator in control of one channel from interfering with the machinery under the jurisdiction of the operator controlling the other channel, these control switches are provided with interlocks. The interlocks are in two vertical racks under each edge of the board and some distance below, so that they may be inspected and oiled from a floor which is about seven feet below the floor on which the switchboard operator stands. The latter floor does not extend across under the board, this space being open so that all parts on the underside of the board are accessible from the floor below.

Vertical shafts operated by connecting rods from the control switch shafts extend downward past the electrical parts for the operation of the interlocks. The interlock system is essentially a bell crank mechanism, connecting the shaft of the control switch through a movable horizontal bar to a vertical operating shaft which can or can not move according to the relative positions of the interlocking bars and dogs. The interlocking rack is a steel frame carrying five horizontal members. Upon these and tying them together are vertical steel straps which carry brass runway posts for the vertical and horizontal interlock bars. These posts are riveted to the vertical steel straps, a thin brass plate between posts and straps making the runways non-corrosive. The vertical operating shafts are of square steel turned on the ends and work in brass bearings near top and bottom of the interlocking rack. Forked cranks mounted on the vertical operating shafts move the horizontal interlock bars by means of pivot blocks set over pin blocks riveted to the horizontal bar. The interlock bars and dogs are of special shape hard extruded brass, which section keeps the dogs in line with the axis of the bars when under pressure by being engaged with another dog on a vertical bar. Every control switch uses a horizontal bar of from 3 to 50 feet long.

The interlock system depends mainly on the action of engaging bevel dogs located on horizontal and vertical bars, the movement of a horizontal bar tending to lift a vertical bar by bevels on the dogs. A horizontal bar can not be moved without raising a vertical bar. Thus if at any time a dog on a horizontal bar rests against the upper end of a dog on a vertical bar, no movement of the horizontal bar where the dog engages with the vertical bar can take place, and the control handle connected to that particular horizontal bar is locked.

Interlocks prevent the chain fender from being lowered until adjacent mitering gates have been opened, and also prevent the gates being opened until the chain is in the raised position. In this way it is assured that the chain fender will always be in the up position to protect the gate when the gate is closed. To avoid unnecessary complication, each end of the chain is interlocked with the leaf on its side of the lock only, because as a rule both leaves of a gate, as well as both ends of a fender chain, will be opened simultaneously, and further interlocking is unnecessary. After the mitering gates are closed, a miter forcing machine is operated by a control handle and locks the ends of the gates closed. This machine cannot be operated until the gates are closed.

Also the rising stem valves of the side wall, next above or below a miter gate, must be closed while the miter forcing machine is open. As the miter forcing machine cannot be closed until the gates are closed, this means that the valves either above or below the gate must remain closed until the gate itself is closed, thus preventing the operator from creating a current of water around the gates while they are open, or being moved in opening or closing. This interlock is not included on the middle wall valves for the reason that they will be used with the locks on either side and must be free for that purpose.



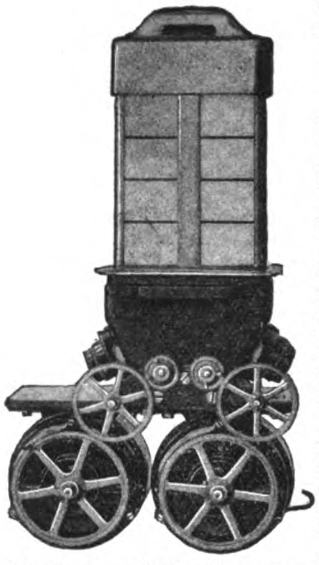
Water Level Indicator

Either pair of rising stem valves may be opened first, at the choice of the operator, an interlock becoming effective when the first valve of the second pair of duplicates is opened. This is done by a novel arrangement of equalizing levers acting against the ends of the interlock bars, with certain definite amount of lost motion which is taken up on opening the first pair of valves, thus putting the interlocks in operation on the next pair. To illustrate this operation, consider, for example, a side wall culvert at Gatun with its principal rising stem valves at each change of level from one lock to the next. The control of these valves is interlocked so that if the valves are opened at one particular point, the valves a lock length upstream or downstream cannot be opened. Thus the operator is limited to equalizing the water between locks and cannot allow water to flow from the upper lock past the middle lock into the lower lock, which operation, if permitted, might flood the lower lock walls and the machinery chambers in them. The cylindrical valves are interlocked so that if those on one side are opened the ones on the other side are locked closed, and the opening of one switch on a side will lock the opposite ten. This prevents careless cross filling between locks, which operation might be combined with the regular method and produce flooding. However, there may be times when it is desireable to employ cross filling to economize in the use of water from Lake Gatun in the dry season. For this reason this interlock is made removable by the

use of a Yale lock and key. The key will be placed in the hands of the chief operator.

In the use of the middle wall culvert, the cylindrical valves on one side or the other must be opened before the rising stem valves can be opened, and the rising stem valves must be closed first. This interlock is applied in order to require the operator to control the flow of water by means of the rising stem valves rather than by the cylindrical valves.

In most cases the locks are divided into two unequal parts by the intermediate mitering gates. This arrangement makes it necessary to divide the ten cylindrical valves into two groups of seven and three, respectively, for the long and short lengths. A selecting lever is provided for these interlocks and may be set as indicated by a nameplate on the lever to "three," "seven" or "ten" respectively; whereupon the corresponding valves are subject to that interlock, and the others of the group of ten are locked closed if three or seven only are to be used. The failure of the operator to make his selection properly in advance will simply cause him the trouble of going back and doing so, as the remaining valves are locked closed. This arrangement permits handling small vessels without causing waste of water due to operating such vessels in the large chambers. If a short vessel were being passed downstream, it would first pass into the chamber having three cylindrical valves. The group selective lever would then be placed on the "three" position which would permit the opening of three valves above the intermediate gate, but would lock closed the other seven valves above it. After the vessel had been passed below the gate the handle may be reversed releasing the lever, and locking three switches.



Rising Stem Valve Indicator

There are intermediate rising stem valves in the side walls at each intermediate gate, but no interlocks are applied to these for the reason that they will be used in a more or less irregular manner, and no fixed laws for their operation can be made in advance. Moreover, they control the water only between different sections of the same lock, and there is not the danger from mistakes in operation which exists in the case of the other valves which control water between lock levels. The same is true of the small auxiliary culvert valves, by means of which the space between the upper guard gate and upper main gate is filled and emptied.

In case a large vessel is to be locked through, the interlocks on the intermediate gates can be made ineffective by the operation of a Yale lock which uncouples a clutch and disconnects the central switch from the operating machanism. Turning the key removes the interlock and permits the intermediate gates to be thrown open to obtain a 1,000-foot level and the valves operated independently of these gates.

To obviate the possibility of flooding the locks when valves are in a certain position, diagonal interlocking is introduced between the rising stem valves of the side wall and those of the middle wall a lock length away. This interlocking between valves diagonally across a lock when the cylindrical valves are open is needed to prevent the flow of water from, say, the upper lock by way of a side wall culvert to the middle lock, thence by way of the middle wall culvert to the lower lock, thus allowing an operator through carelessness to flood the lower lock walls. If the cylindrical valves of a certain lock are closed, the interlock is not needed on the rising stem valves of that lock; and since such interlock would interfere with the proper use of the valves of its twin lock on the other side of the middle wall, this interlock is automatically removed when all ten cylindrical valves are closed on the particular lock in question, and is automatically applied again if one or more of the ten cylindrical valves are opened. Furthermore, the valves of the side wall immediately at the gate which is being moved will be open to equalize water level, and diagonal interlocking will prevent the opening of the middle wall valves a lock length above or below the gate being moved. Each of the four valves of such a group has independent control, their control switches being so interlocked that either pair may be opened and left open as guard valves, the interlocks becoming effective when the operator tries to open the first valve of the second pair. In addition to these pairs of valves in parallel, each pair is duplicated at each change of level from one lock to the next.

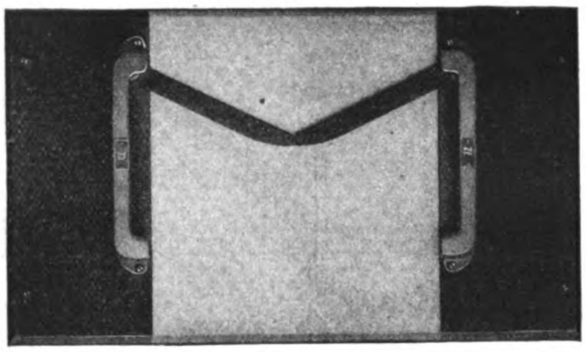
SPECIAL CLIMATIC REQUIREMENTS

To withstand the humid atmosphere of the Isthmus, every insulated part, such as solenoid, relay, circuit breaker and other coils, was impregnated with non-hygroscopic compounds. All small parts were made either of brass, copper, Monel metal, bronze, or of sherardized iron or steel. Mica and treated asbestos lumber were used largely in place of fibre or wood.

INTERESTING MANUFACTURING DETAILS

Nearly two thousand special drawings were required in the fabrication, and there were also involved the following unusual quantities of materials.

Special slate bases	1,300
Small castings	160,000
Screw machine parts	1,200,000
Copper rod and bar	58,000 ft.
Asbestos lumber	9,000 sq. ft.
New patterns	650
New jigs, templates, tools, etc.	625
Porcelain parts	18,000
Special bus supports	6,800
Gal. pipe (framework)	21,000 ft.
Special gears	2,300
Special instruments	640
Miscellaneous sherardized pieces	300,000
Cases for boxing	4,150



Mitering Gate Indicator.

The combined weight of the centralized control boards for Gatun, Pedro Miguel and Miraflores is about 39 tons. In their construction there is employed.

More than 2¼ miles of interlocking rod;

About six million feet of control leads—made up in 5 and 8 conductor cables.

732 indicator motors.

464 control switches.

All of the lock machinery motors, control panels, contralized control boards, power station generating apparatus, switchboards, transmission line substation equipments, coaling stations, and practically the entire electrical equipments, for the wharf terminal cranes and for the extensive permanent repair machine shops were manufactured by the General Electric Company.

WATER PURIFICATION

Messrs. Mather & Platt, Ltd. of Manchester have recently completed three extensive schemes of Water Supply and Filtration and they have in hand several other contracts of a similar nature.

Towards the end of 1912 they completed a scheme of Water Supply and Filtration at Loxley Valley for the Sheffield Corporation. It consisted of 32 filters, each 8 feet diameter, fitted with the improved washing apparatus which is one of the special devices of the mechanical filters manufactured by Messrs. Mather & Platt. The agitating gear of the washing apparatus is driven by line shafting operated from a horizontal oil engine. This installation has been working regularly during the past year and supplies the town with about 7,000,000 gallons of pure water per day. The Sheffield Corporation have since instructed Messrs. Mather & Platt to proceed with a further installation of 24-8 feet filters with coagulating apparatus for the addition of lime and alumina ferric similar to those already installed.

Another recent completion was an extension of the Water Supply and Filtration Plant for the Rhymney & Aber Valleys Gas & Water Co. The original installation consisted of 10-8 feet filters. The present extension comprises a further six similar filters. The whole 16 filters are now in regular use and are giving most satisfactory results.

Last year Messrs. Mather & Platt completed an installation of four of their mechanical filters for the Fraserburgh Corporation, and have recently erected an additional two filters of the same size, viz., 8 feet diameter: the six filters deal with a daily supply of about three-quarters of a million gallons. An installation of six patent mechanical filters is on the point of completion at the Brindley Bank Pumping Station of the South Staffordshire Water Co.

Other recent contracts included two 8 feet filters for the Rhymney & Aber Valleys Gas & Water Co., two for the Newquay and District Water Board, two for Salford Corporation Electricity Works, eighteen 9 feet filters for the Oldham Corporation, one for Accrington Electricity Works, one 6 feet filter for the Paisley Corporation and two 8 feet filters for Llandrindod Wells.

In addition the firm has in hand several contracts for abroad including 6 filters for India and 3 for South Africa.

Messrs. Mather & Platt point out that they are in a position of advantage in the carrying out of schemes of Water Filtration and Purification inasmuch as although there are many firms who manufacture Filters, Water Softeners and Sewage Plant singly they are the only firm who manufacture appliances for the whole three sections. They are consequently familiar with all the details necessary for the effective carrying out of either Municipal Water Purification work or the installation of an industrial Filtration scheme.

CONSTRUCTION OF RAILWAYS IN CHINA

The Ministry of Communications has addressed the following petition to the President requesting that no loans should be contracted for the construction of new railways which have not yet been proposed or started:—

For want of means of communication much inconvenience has been felt for the progress of administration and the economic condition of the country. Those who are anxious about the situation of the country have unanimously advocated that the only means of salvation lies in the construction of more railways. Since the inauguration of the Republic the idea of inviting foreign capital for the development of railways has become deeply rooted in the mind of the public. Therefore for the past two years this Ministry has, according to the internal and external conditions of the country, drawn up plans for the construction of all the important lines, as reported from time to time, and it has been estimated that the mileage of these proposed lines is tens of times longer than before. Consequently there are thousand and one difficulties to be solved. The railways which have already been constructed have to be properly managed. The railways the ownership of which has been transferred to the Government, have to be settled. Those which are under construction should be continued properly. Those the concessions of which have been given out, should be built according to the time limit. Men should be trained immediately to manage these lines, and diplomatic intercourse should be attended to with care. The interest and principal of foreign loans should be met in due course.

Hitherto we have contracted foreign loans for the construction of railways, but on account of the lines being unskilfully chosen or want of forethought, the Government has to put in tens of millions of dollars to assist in the enterprise. Moreover for want of centralization of finances this Ministry has to shoulder the whole responsibility. Therefore the whole year round this Ministry has to attend to the means of financing the railways, and consequently there has been no time left to attend to the other immediate affairs. Hence many complaints have been received. If in former days more attention had been given to the railway affairs, better plans made and the redemption of loans carefully planned there would not be so many difficulties besetting us to-day. However the past serves a good warning. No hasty steps should now be taken to injure the general situation and to sow difficulty for the future. Therefore in every step we now take it should be done with utmost care. Although there is no comparison between the mileage of railways of this country and that of the other countries in Europe or America, it must be borne in mind that the development of railways must be in proportion to the development of industry, the politics and the economical condition of the country. Moreover there must be a general plan for all the lines of the country. Hence this Ministry is now being engaged in the work of making the general plans, and at the same time we have been collecting the ideas of experts of this country. Hereafter it is desirable that no blunder should be made. Therefore it is hereby requested that a policy for the construction of the railways should be definitely fixed. Henceforth, regarding the contracting of loans for the construction of railways, with the exception of the concessions the contracts of which have been signed, or the lines have already been proposed all the other railways projects should be stopped.

The President approved the proposal and instructed the Ministry to enforce the same.

ELECTRICAL ENTERPRISE IN KOREA

Up to the end of last year official permission was granted to 18 companies desirous of undertaking electric enterprises in Korea. The aggregate capital of these companies amounted to 11,880,000 *yen* and the total capacity of the plants to be possessed by them for generating electricity was 8,100 kilowatts. Fifteen companies with a capital of 11,730,000 *yen* were actually engaged in business with a paid-up capital of 6,497,840 *yen* between them. The number of householders receiving the supply of electricity was 11,058, the lamps installed in these houses numbering 77,880 in all.

This year, permission has been granted to the electric company at Suwon, which has a subscribed capital of 60,000 *yen*, of which 21,000 *yen* has already been paid in. The machinery of the company is able to generate 40 kilowatts of electricity. At present the company supplies electricity to about 300 households. Two more electric companies, one at New Wiju and the other at Hamheung, are now engaged in construction work.

HUPEH CEMENT WORKS

A Peking correspondent states that he is reliably informed that the trouble between the French Banque Industrielle and the Hupeh Cement Works has been settled by the assistance of the Cheehsin Cement Company of Tangshan which, with the permission of the Chinese Government, has lent the sum of Tls. 1,400,000 to the Hupeh Cement Works for the payment of the French loan and its Japanese creditors. Thus the Hupeh Cement Works, of which Mr. Cheng Chu-fu will probably remain Director, will be administered by the Cheehsin Cement Company. In view of the success of the Tangshan Cement Works during the last few years, it is believed that there is a good future before the Hupeh Works.

The Chinese Cement Works at Canton has petitioned the Ministry of Commerce requesting that the Provincial authorities of Kuangtung should be instructed to protect the works and not allow foreigners to buy shares or interfere in any way with the enterprise.

In the course of a recent lecture on "Electric Traction," given in the large hall of London Bridge Station, Mr. P. Dawson, consulting electrical engineer to the London, Brighton and South Coast Railway, said that so far as the electrification of main line railways was concerned, equal progress had been made in Europe and in America. About 2,000 miles of single track had been electrified in each case. He regarded as the most important electrification scheme so far carried out that of the New York, New Haven, and Hartford Railway.

A rope railway, 75 miles in length, is to be put into operation in India. It will connect the rich country in the vale of Kashmir with the plains of the Punjab over the Himalayas. The line, it is claimed will be the longest in the world, the present longest being 22 miles and situated in Argentina. Sections will be 5 miles long, and most of the spans will be 2,400ft. The steel towers, some of which will be 100ft. high, will be braced, and double 1½in. cables, 9ft. apart, will carry the steel cars. The carrying capacity of these cars will be about 400 lb.

The Seishin-Kwainei Railway, 60 miles in length, is to be constructed in the course of five years from the present fiscal year. A tendency has been observed these few years for a gradual increase in the imports to North Manchuria via the port of Seishin on the northeastern coast of Chosen. The markets of Japanese imports to Chientao and Hunchun are expanding. As the railway construction work progresses inland, the completed section will be utilized to quicken this tendency, and, when the whole line is finished, the trade system of the eastern part of Kirin Province on the Korean frontier will be revolutionized. Y. 200,000 is set apart chiefly for preparatory work.

During last March, the Electricity Works, Changchun, supplied 60,244 kilowatts of electricity for 11,650 lamps in addition to 122,152 kilowatts for motor power. The total earnings for that month amounted to Y.10,241, as against Y.5,478 for the corresponding month of last year. The demand for power use nearly doubled in the course of a year.

FAR EASTERN RAILWAYS

CHINA

The Chekiang Railway.—It is reported that a satisfactory arrangement for the handing over of the Chekiang Railway to the Government has been arrived at. The price to be paid to the shareholders of the company has not been officially stated, but is said to be $17,000,000.

Kirin-Changchun Railway.—The traffic receipts of the Kirin-Changchun Railway for March decreased to S. Y.67,788. The two terminal stations at Toutaokon (the junction between the S. M. and the K.-C. lines) and Kirin contributed the largest shares, giving S. Y.26,651 and S. Y.24,738 respectively. The Changchun Station followed with S. Y5,307. The receipts of the other stations were less than S. Y. 2,000.

Pukow-Singyang Line.—It was the original intention to start construction of this line from Wu-i and Singyang simultaneously, but owing to the disturbed conditions in Honan this could not be done. The Director General, Mr. Shen Yun-pei has now given instructions that work should be started on the Singyang section as soon as possible.

Shanghai Nanking-Railway.—The following figures of traffic returns (approximately) for the week ended March 14 are issued by the Shanghai-Nanking Railway:—

Year.	Passengers.	Goods & Sundries.	Total for the week.
	$	$	$
1914....	46,642	11,250	57,892
1913....	52,337	11,962	64,299
Increase.	—	—	—
Decrease	5,695	712	6,407

For thirty-seven weeks.

Year.	Passengers.	Goods & Sundries	Total
	$	$	$
1914 ...	1,754,463	364,222	2,118,685
1913....	1,555,812	340,804	1,896,652
Increase.	198,651	23,382	222,033
Decrease	—	—	—

Week ended March 21.

Year.	Passengers.	Goods & Sundries	Total
	$	$	$
1914....	54,688	12,610	67,298
1913....	50,512	11,430	61,942
Increase.	4,176	1,180	5,356
Decrease	—	—	—

For thirty-eight weeks.

Year.	Passengers.	Goods & Sundries.	Total.
	$	$	$
1914....	1,809,151	376,832	2,185,983
1913....	1,606,324	352,270	1,958,594
Increase	202,827	24,562	227,489
Decrease	—	—	—

Week ended March 28.

Year.	Passengers.	Goods & Sundries	Total
	$	$	$
1914	51,383	11,348	62,731
1913	53,252	10,351	63,603
Increase.	—	997	—
Decrease	1,869	—	872

For thirty-nine weeks.

Year.	Passengers.	Goods & Sundries	Total
	$	$	$
1914....	1,860,534	388,180	2,248,714
1913....	1,659,576	362,621	2,022,197
Increase.	200,958	25,559	226,517
Decrease	—	—	—

Week ended April 4.

Year.	Passengers.	Goods & Sundries.	Total for the week.
	$	$	$
1914....	49,865	12,141	62,006
1913....	49,069	9,431	58,500
Increase.	796	2,710	3,506
Decrease	—	—	—

For forty weeks.

Year.	Passengers.	Goods & Sundries.	Total.
	$	$	$
1914....	1,910,399	400,321	2,310,720
1913....	1,708,645	372,052	2,080,697
Increase.	201,754	28,269	230,023
Decrease	—	—	—

Week ended April 11.

Year.	Passengers.	Goods & Sundries.	Total for the week.
	$	$	$
1914	60,434	12,799	73,233
1913	48,998	10,996	59,994
Increase.	11,436	1,803	13,239
Decrease	—	—	—

For forty-one weeks.

Year.	Passengers.	Goods & Sundries	Total
	$	$	$
1914....	1,970,833	413,120	2,383,953
1913....	1,757,643	383,048	2,140,691
Increase.	213,190	30,072	243,262
Decrease	—	—	—

GENERAL

The Amur Railway.—The following information is from the report by H. M. Consul at Vladivostok, Mr. R. M. Hodgson, on the trade of that district in 1912:—

The Amur Railway, which is to connect, by means of a line entirely in Russian territory, the Siberian railway system with Khabarovsk and thence, by the already existing Ussuri Railway, with Vladivostok, has been progressing with unexpected rapidity. The distances on this line are as follows:—

	Versts.
Head section, from Kwenga to Urium ..	182
Western section, from Urium to Kerak..	596
Middle section, from Kerak to River Dyia	633
Eastern section, from River Dyia to Khabarovsk	480
Branch from Botchkaryoyo to Blagovestchensk	100
Short branch lines run to—	
Tchasovinskaya	28
Reynovo	63
Tchernayevo	40

Traffic on the head section has been open since 1910 and the western section was opened in the autumn of 1913. The whole of the middle section will be handed over for working in the autumn of 1914. Work on the eastern section is being pushed forward rapidly, and it is now likely that the whole line will be in use for local traffic by the end of 1914. The completion of the railway will, however, be impossible before the bridge over the Amur at Khabarovsk is finished, and this—an engineering work of real magnitude, for the bridge is to be 7,038 feet in length—cannot, at the earliest, be before the autumn of 1915. It is intended ultimately to divide the whole line into two parts, the eastern part to be known as the Amur Railway and to have its headquarters at Alekseyevsk on the Zeya River, and the western part, known as the Ussuri Railway, having its headquarters at Khabarovsk.

Russia is thus within measurable distance of executing, well within the projected time, the very formidable undertaking of constructing a railway 1,248 miles in length through country much of which was previously untrodden, and nearly all was uninhabited. Natural obstacles in the form of swamps and mountain ranges are met with all along the line except in the Zeya-Bureya district; the climate is extremely rigorous, and large tracts lie within the zone of perpetually frozen ground; moreover, it has been necessary to bring the whole working staff from great distances, mostly from European Russia. Under these conditions it is not surprising that the difficulties to be overcome were underestimated at the beginning, and that the expenditure has exceeded the original appropriations by some 40,000,000 roubles (about £4,222,000) or 20 per cent.

On the Ussuri Railway, important works are to be carried out, and 29,297,000 roubles (about £3,092,000) have been allotted for the purpose. The line is to be doubled throughout and between Kiparissovka and Nadyedjdinskaya, near Nikolsk, the permanent way is to be changed and a tunnel 2,450 feet in length cut. The branch line to Shkotovo is to be improved. The building of wharves for coal, timber and fish on the southern side of Golden Horn Bay renders a connexion with the railway system indispensable. A branch line, 14.37 versts in length, is to be constructed for this purpose from Pervaya Ryetchka—the first station out of Vladivostok on the Ussuri line—at a cost of 3,956,630 roubles (about £417,000). It will go round the Eastern extremity of the bay and will pass through a tunnel 4,200 feet long.

A further project now being investigated is the building of a railway line from Shmakovka on the Ussuri Railway near Lake Hanka to the coast at St. Olga, or from Khabarovsk to Imperial Harbour. The Ministry of Ways of Communication is at present studying the relative advantages of the two routes. Some connexion by rail with the coast of the Maritime Province is obviously necessary.

The land connexion with Europe is by the Siberian Railway, there being two express trains every week to and from Moscow, and one to and from St. Petersburg. The journey by these trains to London takes 12½ days. A very considerable economy can now be effected by leaving the Trans-Siberian express and utilizing the daily express which has lately started running between Irkutsk and Moscow; this train does the journey in the same time and has a restaurant car and similar accommodation to the Trans-Siberian express.

Russian Railway Concession.—The Russian Far Eastern Press reports the acquisition of two valuable railway concessions by Russian subjects. One is for the construction of a railway from the station Manchuria, at the junction of the Chinese Eastern and Trans-Baikal lines, to Urga, which has been given to Mr. Badmaev, one of the pioneers of the trading firm of that name in the Trans-Baikal, which region was thickly sprinkled with branch houses during the building of the Trans-Baikal Railway. The second concession is for a line from Manchuria station to Nerchinsk Zavod and Sreytensk, granted to the former Minister of Commerce and Industry, Mr. Fedorov. This variant will proceed from the station Manchuria along the banks of the Argun to the station Olocha and beyond by the Olocha valley to Nerchinsk Zavod, and thence to Sreytensk on the Shilka. If these projects should be realized, Manchuria station will be an important junction on the borders of three states—Russia, China, and Mongolia. The Vladivostok correspondent of the "Japan Chronicle" says it is understood that Mr. Denisov, member of the Imperial Council and

President of the Board of Trade, has been largely instrumental in getting these deals pushed through, albeit in some quarters doubts are expressed as to the likelihood of there being money available in the present disturbed political condition of Mongolia. Be this as it may, Mr. Denisov appears to have satisfied himself on the spot, and to be engaged now in convincing others at St. Petersburg that for Russia the development of a widespread network of railways in the Far East is indispensable.

MANCHURIA

South Manchuria Railway.—The net profit for the current fiscal year ending the 31st inst. was estimated to be about Y. 5,000,000. The traffic earnings, up to last February totalled Y.20,197,000, as against the aggregate of Y.19,900,000 for the preceding fiscal year. A similar increase has been noticed in the other enterprises, such as mining, harbor, electricity, gas, shipping, etc. The net profit for the last fiscal year was Y.4,920,000, the gross profit and gross loss amounting to Y.33,540,000 and Y.28,620,000 respectively.

The traffic returns for the month of March were Y. 2,010,298, being a decrease of Y.548,218 compared to the corresponding month of last year. The decrease was owing to scarcity of Bean stocks due to the poor crops. The aggregate receipts for the fiscal year just closed reached Y. 22,237,833, being an increase by Y.2,330,377 on the earnings of the preceding fiscal year.

Chinese Eastern Railway.—The Chinese Eastern Railway has lowered the freight rates on coal from Ugolinaya which is the junction station to Sucheng Colliery, and Ippolitoffka which also connects with a small coal mine, to the other stations in North Manchuria. The comparative figures to Manchouli and Harbin are as follow:—

From		To Manchouli per pud	To Harbin per pud
Ugolinaya	old rate	21.10	9.50
	new „	13.10	5.88
Ippolitoffka	old rate	19.70	8.10
	new „	12.17	4.92

The management evidently hopes to supply coal as a cheaper substitute for firewood, which rose to 34 roubles per cube from about 20 roubles of a few years ago and appears settled about 27 roubles. Even Fushun Coal, which is sold at about 12 roubles per ton, is still cheaper by three or four roubles, if two tons of coal is computed to be equal to a cube of firewood calorific power in calorific power.

CHOSEN (KOREA)

Taiden-Mokpo Line.—Celebrations were held at Mokpo on March 22 in connection with the completion of the railway from Taiden, a town in central Korea on the Seoul-Fusan railway, to Mokpo on the South-west coast. The construction of the Taiden-Mokpo line or Honan Railway, as passed by the 26th session of the Imperial Diet, was planned to be carried out in 11 years beginning from the fiscal year 1910, but thanks to the influence of the present Governor-General, Count Terauchi who recognized the importance of transport facilities in Chosen, the original plan was modified and the time of construction reduced to five years instead.

The line starts from Taiden, a station on the Seoul Fusan Railway, and reaches to Mokpo 161 miles with 14.8 miles branching from Riri out to Kunsan. The surveying was begun in May, 1910, and the civil engineering work in October. Up to the end of the fiscal year 1911-1912, 69 miles—38 miles of the Taiden-Rokei section, 17 miles of the Kokei-Riri Section and 1.48 miles of the Riri-Kunsan Branch — were constructed and opened to traffic. Great engineering difficulties had to be overcome on the section passing through the beautiful and grand Noryong Mountain Range, situated between Seiyu and Chojyo Stations, for several large tunnels, one more than 3,000 feet in length had to be driven through hard rocks. Nevertheless the whole line could be opened at the beginning of January last to public traffic, much sooner than was expected.

TRAMWAYS

Shanghai Tramways.—The returns of the Shanghai Tramways (Foreign Settlement) for the week ended March 18, 1914, are as under:—

	1914. $	1913. $
Effective receipts (after deducting loss by depreciation of subsidiary coinage)	18,412.31	14,957.16
Passengers carried	988,636	757,692
Car miles run	59,893	48,790

The loss by depreciation of subsidiary coinage for the week was $5,499.09 equal to 24.35 per cent. of the gross cash collected on the cars as compared with $4,228.13, equal to 23.49 per cent. for the corresponding week last year.

Week end March 25.

	1914. $	1913. $
Effective receipts (after deducting loss by depreciation of subsidiary coinage)	18,080.99	15,623.23
Passengers carried	966,908	792,783
Car miles run	61,044	49,274

The loss by depreciation of subsidiary coinage for the week was $5,393.88 equal to 24.36 per cent. of the gross cash collected on the cars as compared with $4,467.13 equal to 23.61 per cent. for the corresponding week last year.

Week ended April 1.

	1914. $	1913. $
Effective receipts (after deducting loss by depreciation of subsidiary coinage)	18,505.03	15,470.40
Passengers carried	992,098	782,940
Car miles run	60,865	49,375

The loss by depreciation of subsidiary coinage for the week was $5,562.53 equal to 24.46 per cent. of the gross cash collected on the cars as compared with $4,411.38 equal to 23.60 per cent. for the corresponding week last year.

The following is the traffic return for the month of March, 1914, and for three months ended March 31, 1914, with figures for the corresponding periods last year;—

	Mar. 1914. $	Mar. 1913. $
Effective receipts	81,216.62	69,167.94
Passengers carried	4,342,343	3,499,970
Car miles run	265,948	221,018
Loss by depreciation of subsidiary coinage.	24,269.49	19,639.47
Percentage of loss by depreciation of subsidiary coinage.	24.38	23.50

	Three months ended Mar. 31, 1914 $	Three months ended Mar. 31, 1913. $
Effective receipts	237,638.63	201,794.00
Passengers carried	12,449,793	9,992,856
Car miles run	762,890	648,747
Loss by depreciation of subsidiary coinage	68,380.59	53,464.22
Percentage of loss by depreciation of subsidiary coinage	23.64	22.31

Week ended April 8,

	1914. $	1913. $
Effective receipts (after deducting loss by depreciation of subsidiary coinage)	18,968.38	16,498.28
Passengers carried	1,012,456	825,361
Car miles run	61,654	49,840

The loss by depreciation of subsidiary coinage for the week was $5,724.28 equal to 24.50 per cent. of the gross cash collected on the cars as compared with $4,635.67 equal to 23.24 per cent. for the corresponding week last year.

Week ended April 15.

	1914. $	1913. $
Effective receipts (after deducting loss by depreciation of subsidiary coinage)	20,621.51	17,203.86
Passengers carried	1,093,636	847,762
Car miles run	63,424	51,766

The loss by depreciation of subsidiary coinage for the week was $6,255.49 equal to 24.48 per cent. of the gross cash collected on the cars compared with $4,856.64 equal to 23.28 per cent. for the corresponding week last year.

Kyushu Electric Tramway Co (Japan).—It is reported that the Kyushu Electric Tramway Company has decided to double the capital of the company, which then will be 6,300,000 *yen*.

The new shares representing the augmented capital will be issued to the original shareholders at the rate of one to every one old share.

SHIPBUILDING

Hongkong and Whampoa Dock Co.—An important shipbuilding contract has just been signed under which the Hongkong and Whampoa Dock Company are to build for the Nord Deutscher Lloyd a first class steamer for the China coast trade, says the *Hongkong Telegraph*. The steamer which is to be built to the rules of the Germanischer Lloyd has the following dimensions:

Length overall	259 ft.
Breadth	38 ft.
Depth	17 ft.
Speed	12 knots

The accommodation for the first and second-class with be of quite an up-to-date nature and will follow the lines set out in the mail steamers of the Company. In the dining room the old system of the one long table will be done away with and the new restaurant fashion with small tables, seating four at a time, will be installed. Large windows with patent brass frames will be a feature of the dining saloon, with double doors and all the latest methods of ensuring a cool breeze. The state rooms have been designed with the idea of securing the greatest possible space in each compartment, fitted throughout with electric light and fans which may be controlled from the berths or the settee.

The second class cabins will be situated aft and will follow the lines of the first-class, while the third-class and deck passengers will be carried on the top deck.

Cooking for the various classes of passengers will be carried out in European, Chinese, and Malay galleys.

The vessel being primarily a mail carrier, dead weight has given place to draught and in consequence of this the cargo carried will not exceed one thousand tons, to deal with which powerful steam winches and a twenty ton derrick will be installed. The latter is to deal with the heavy machinery that is now being imported into China and Malaya.

The machinery will consist of two sets of 2,000 H. P. I. triple expansion engines with cylinders H. P. 17in. E. P. 27in. L. P. 44×30in. stroke. Three single-ended boilers will supply 190 lbs. steam pressure. The shafting will be protected throughout, the shell plating being carried to the cast steel propeller brackets.

The anchors, and cables, will be complete to meet the emergencies of typhoons and rough weather a steam windlass with a capstan on the forecastle head being installed for quick warping. A complete electric light plant, fed by two dynamos, will provide illumination for the cabins and saloons, and for handling cargo at night.

The Dock Company have already constructed six steamers for the N. D. L. as well as other craft, but this is the largest order that the latter has placed with the Company. Work, which will be carried on under the supervision of the acting Supt. Engineer, Mr. Nielsen, has already been commenced, the keel having been laid.

Shanghai Dock and Engineering Co., Ltd.—On March 28, the steel, twin-screw steamer Tung Wo was successfully launched from the Pootung Yard of the Shanghai Dock and Engineering Co., Ltd. The vessel was built for carrying passengers and cargo on the Upper Yangtsze, measures 242 feet and 6 inches long, 40 feet moulded breadth, and 10 feet moulded depth. European and Chinese saloons and the usual stateroom accommodation for 12 Europeans and 20 Chinese, having all the latest furniture and fittings, are fitted on the saloon deck. On the main deck is accommodation for 24 second-class and 180 third-class Chinese passengers. The office accommodation is large and roomy, and that for the crew, compradore, and others, is in keeping with this class of vessel. Electric light and fans, steam steering gear, steam windlass and capstan at forward end and steam capstan at after end are installed. The propelling machinery consist of two sets of triple expansion engines with independent condensers and pumps, filters and feed heaters, the steam being generated in a large multitubular cylindrical boiler fitted with forced draft. All the machinery and boilers, as is usual in steamers built by the Dock Co., are being made in their own workshop. The vessel is principally required to carry as much cargo as possible on light draft, and has thus been designed to carry a 1,000 tons cargo on 8 feet draft. She is much the same style as but larger than, the Kian and Siang Tan built by the same builders for the China Navigation Co. a few years ago, and which have proved very successful. The order was given for the vessel on September 10 of last year, and the contract time to complete was nine months, so the vessel is well within her time, this result being due in a great measure to the resources of the Dock Co. and the large stock of building material always carried by them.

The vessel has been taken to the builders' New Dock sheerlegs to have the boilers lifted on board, the machinery being already installed, and a few weeks should see the vessel ready for her official trials.

On April 23 the U. S. gunboat *Palos* was launched at the Shanghai Dock and Engineering Company's International Dock, the christening ceremony being performed by Mrs. L. S. Border, wife of the superintending constructor. A sistership, the *Monocacy*, was launched at the same dock on April 27, Mrs. A. F. Carter, wife of Lieut. Carter, who is to command the gunboat, performing the christening ceremony. These vessels were originally built at the Government Navy Yard at Mare Island, California, except that the plates were only bolted together. They were then "knocked down" and the various parts crated for shipment to China, being sent out by the Pacific Mail Company's steamer *Mongolia*, which arrived last January. They were erected by the Shanghai Dock and Engineering Company under contract with the Government, the work being supervised by Assistant Naval Constructor L. S. Border, U. S. N., and Lieut. A. F. Carter, as inspector of machinery, assisted by a draughtsman and quarterman machinist.

The *Monocacy* and the *Palos* are of 190 tons designed displacement; 160 feet b. p.; 165 feet overall; 24½ feet beam; and 2 feet 5 inches designed draft. They are propelled by twin screws, and are expected to make over 13 knots on trial. The boilers are of the special B. and W. type, and the engines were built at the Mare Island Navy Yard, California.

Kawasaki Dockyard.—The Nippon Yusen Kaisha steamer Yasaka has been successfully launched from the Kawasaki Dockyard, Kobe. The Yasaka Maru is a sister ship of the Suwa Maru, which is now under construction at the Mitsu Bishi Dockyard at Nagasaki. When the equipment of the steamer is completed in October this year, she is to be employed on the Company's European line. Though all the other vessels of the Company have been decorated in English style, the cabins and saloons of the Yasaka Maru are to be equipped after the German style. The principal dimensions of the Yasaka are as follows:—

Length	505 feet.
Beam	63.6 „
Depth	37.7 „
Gross tonnage	12,000 tons.
Draught	20,600 „
Speed	16 knots.

She will accommodate 122 first class passengers, 60 second class and 180 steerage.

LIGHT AND POWER

Anglo-Japanese Water-Power Electric Co.—This Company intends to increase its capital (now 1,200,000 *yen*) to 3,000,000 *yen* for the purpose of establishing a new power station on the Tomoe-gawa, Aichi-ken. At present, the company is generating 3,000 H.P. of electricity, and getting the supply of 2,000 H.P. from the Nagoya Water Power Electric Company. The total 5,000 H.P. is found inadequate to meet the demands of the consumers in Hamamatsu and neighbourhood.

Antung Electricity Works.—At the end of last March the South Manchuria Railway Co. Electricity Works at Antung had 1,500 subscribers using 8,000 lamps convertible to 9,000 lamps on the 16 candlepower basis. Motor supplied to various factories, etc., amounted to 241 horsepower, with applications for 115 horsepower. An alternator, directly coupled with a suction gas engine, ordered from Germany will be installed at the powerhouse No. 1 in June.

COMPANIES

China-Borneo Co., Ltd.—The accounts of this company show a profit of $120,891.13

From this had to be deducted:—

Fees to Consulting Committee	4,000.00
Leaving available for appropriation	$116,891.13
The Consulting Committee recommended that a dividend of $1.20 per share on the Subscribed Capital be paid to Shareholders	$55,200.00
Write off Launches and Lighters	10,000.00
Write off Hongkong Saw Mills	5,000.00
„ „ Sandakan Saw Mills	7,500.00
„ „ Plant account	4,000.00
„ „ Sandakan Engine Works	6,000.00
Write off Timber Concessions	1,000.00
Bonus to staff	2,747.06
Transfer to a fund to be formed to provide for insurance of Company's Launches and Lighters	25,000.00
Carry forward	444.07
	$116,891.13

Hongkong Cotton Spinning, Weaving and Dying Co.—This company has been voluntarily wound up and its business transferred to Shanghai, where operations will be carried on by a new company to be called the Yangtszepoo Cotton Mill, Ltd.

Shanghai Horse Bazaar Co., Ltd.—The audited accounts for the year ended December 31, 1913, showed a balance to the credit of profit and loss account of Tls. 27,306.89, which the directors recommended the shareholders to deal with as follows:—

	Tls.
A Dividend of 8 per cent.	21,600.00
Carry forward to a new "Profit and Loss Account"	5,706.89
	Tls. 27,306.89

Soy Chee Cotton Co., Ltd.—The balance at credit of profit and loss account on December 31, 1913, was Tls. 189,000.147 to be apportioned as follows:—

To pay a dividend of Tls, 6.-, on 20,000 Shares	Tls.	120.000.—
Place to dividend equalization fund	„	20.000.—
Write off for depreciation	„	25.000.—
10 per cent. Commission to general managers in accordance with articles of association	„	18,584.25
Carry forward to new Account	„	5.415.89

Osaka Shosen Kaisha.—At a recent meeting of the shareholders of this company it was decided to increase the capital by a quarter—Y.8,250,000. The new shares are to be allotted to shareholders at the rate of one for two old shares on June next. Y. 12.50 is to be called on each share on a date to be fixed later. When the capital is increased as decided it will stand at Y. 24,750,000 in 49,000 shares of Y. 50 each.

Luzon Sugar Refining Co., Ltd.—This Company's report for the year 1913 and statement of accounts to December 31, 1913 are as follow:—

Owing to the severe competition of Haiwaiian Sugars in the local market throughout the year, it was impossible to refine at profitable prices. The result of the year's working shows a loss of $4,297.32, and, after allowing for interest and other charges, the balance at debit carried forward has been increased to $69,211.99.

Kabuto Beer Brewery Co. (Japan).—This Company's accounts show:—

	Yen.
Gross earnings for the latter half of 1913	116,537.293
Gross disbursements for the term	107,587.828
Balance	8,949.365
Brought over from last account	1,646.032
Total	11,595.397

This latter amount is to be disposed of in the following manner:—

Legal reserve	450.000
Bonuses for officials	250.000
Dividend at 8 per cent.	8,715.000
Carried forward to next account	1,180.997

Onoda Cement Co.—The Onoda Cement Co., running an extensive factory at Choushuitzu (the next railway station from Dairen),

at its 57th regular general meeting of the shareholders recently held, passed the reports, statement of accounts, etc., as submitted, for the half-year ended November, 1913.

The substance of the statement of accounts follows:—

Gross profit for the term	Y.1,161,072.657
Gross loss for the term	1,029,288.362
Net profit	131,784.295
Brought forward from the preceding term	111,839.835
	243,724.130
Disposed of as under:—	
Reserve fund	45,000.000
Bonus to officers, &c.	13,000.000
Dividend to shareholders at 8 % per annum	60,000.000
Special dividend to shareholders at 2 % annum	15,000.000
Carried forward to the next term	110,624.130
	243,624.130

Tokyo Gas Co.—The profit and loss account for the last term of six months was as follows:—

	Yen.
Net profits for the latter half of 1913	1,636,855.027
Brought over from last account .	37,733.028
Total	1,674,588.057
Compensation to the Tokyo Municipality for the use of public roads..................	98,211.300
Fees for directors and auditors and social expenses	32,737.100
Pension reserves.................	16,368.550
Loss reserves	82,000.000
Special reserve	92,271.107
Dividend at 9 per cent.	1,353,000.000
Total........................	1,674,588.057

Kanegafuchi Cotton Spinning Co. (Japan.)—The profit and loss account for the last term of six months was as follows:—

	Yen.
Net profit for the latter half of 1913	1,855,198.824
Brought over from last account .	1,614,390.737
Total...	3,469,589.611
To be distributed:—	
Dividend at 12 per cent.	897,997.800
Special dividend at 4 per cent. ...	299,332.600
Reserves...	150,000.000
Pension reserve	100,000.000
Fund for the improvement of the conditions of operatives... ...	100,000.000
Bonuses for auditors and directors	80,000.000
Carried forward to next account	1,842,259.211

Hongkong Rope Manufacturing Co., Ltd.—The balance at credit of profit and loss account on December 31, 1913, after allowing for the interim dividend of $60,000 paid in August last was $63,587.88, which was appropriated as follows:—

Reserve Fund	$ 1,000.00
Final Dividend of $1 per share ...	60,000.00
Carry forward to the credit of next year's account...	2,587,88

New Engineering and Shipbuilding Works, Ltd., (Shanghai).—The balance at credit of profit and loss account on December 31, 1913, which together with the premium on the new issue of shares and the amount brought forward from last year, amounted to Tls. 185,314,48, which was apportioned as follows:—

	Tls.
To pay a dividend of 16 per cent.......	50,958.40
Transfer to reserve fund...............	100,000.00
Transfer to dividend equalization fund...............................	15,000.00
Write off for depreciation	10,000.00
Carry forward to new account.........	9,356.08
Tls.	185,314.48

Hall and Holtz, Ltd. (Shanghai).—The statement of the Company's accounts for the year ended February 28, 1914, showed that the profit for the year, including $9,049.41 brought forward from last year, amounted to $99,779.81 which the Directors recommended should be disposed of as follows:—

A Dividend of $2.00 per share (10 per cent).........................	$52,676.00
Carry forward to new account......	47,103.81
	$99,779.81

Union Waterboat Co., Ltd. (Hongkong).—The annual report and statement of the Company's accounts made up to 31st December, 1913, reads as follows:—The net profits for the year ended 31st December, 1913, after allowing for consulting committee and auditor's fees, amount to $64,744.63. The general managers recommend the payment of a dividend of 12½ per cent., which will absorb $34,653.75, write off $28,000 from the value of the waterboats, $1,500 off investments, $400 from the value of pipes and staging, and carry forward a balance of $190.88 to the new account.

Hongkong, Canton and Macao Steamboat Co., Ltd.—The report of the Board of Directors for the year ending 31st December last says:—

After paying running expenses, salaries, premia of insurance, repairs, an interim dividend of $80,000 and all other charges there remains, including $22,845.88 brought forward from last account, the sum of $197,827.75 at credit of profit and loss account. From this amount the directors recommend that a final dividend for the year of one dollar per share or $80,000 be paid to shareholders, $60,000 be written off the book value of steamers and wharves, $30,000 be transferred to credit of special repairs fund, leaving a balance of $27,827,75 to be carried forward to new account.

Shanghai Waterworks Co., Ltd.—The report of the directors for the year ended December 31, 1913, states:—

The gross revenue for the year from all sources amounts to Tls. 601,328.79 as against Tls. 571,686.84 in 1912, and that the balance of working account, transferred to credit of profit and loss account, is Tls. 425,503.57 as against Tls. 409,233.65 the previous year.

An interim dividend of 15/- per share at Exchange 2/7¾, absorbing Tls. 92,692.91, was declared and made payable on July 25 last. After writing off Tls. 15,000.00 for depreciation on permanent works, paying interest on Debentures and sundry other items, there remains a sum of Tls. 300,988.36 at credit of profit and loss account available for distribution, which the directors recommend be disposed of as follows:—

	Tls.
To payment of a final dividend for the year of 33/- per share at ex. 2/7⅛ per Tael	208,019.28
To equalization of dividend account	20,000.00
To reserve fund	30,000.00
To carry forward to new account ..	42,969.08
Tls.	300,988.36

Hongkong Land Reclamation Co., Ltd.—The twelfth report of the Board of Directors states that for the year ending 31st December, 1913, the net profits including $666,852.33 brought forward from last account, after paying all charges, amount to $780,788.15. It is now proposed to pay a dividend of 7 per cent. on the paid-up capital, after providing for which and writing off directors' and auditors' fees there remains a balance of $698,669.57 to be carried to the credit of a new profit and loss account.

Hongkong Land Investment and Agency Co., Ltd.—The twenty-fifth report of the company states that for the year ending 31st Dec., 1913 the net profits including $16,814.83 brought forward from last account, after paying all charges, amount to $394,487.78. From this amount an interim dividend of $3.50 per share has already been paid.

It is now proposed to pay a final dividend of $3.50 per share, and after writing off directors' and auditors' fees there remains a balance of $9,550.68 to be carried forward to the credit of a new profit and loss account.

Humphreys Estate & Finance Co., Ltd. (Hongkong).—The report of the directors for the year ending 31st December, 1913, states:—

The net profit for that period, including $5,079.50 brought forward from last account amounts to		$92,363.78
From which have to be deducted:—		
Remuneration to directors 5 per cent. on net profit	$4,364.21	
Remuneration to General Managers 5 per cent. on net profit..	4,364.21	
		8,728.42
Leaving a balance of		$83,635.36
Which the directors recommend should be appropriated as follows:—		
Pay a dividend of 50 cents per share		$75,000.00

West Point Building Co., Ltd. (Hongkong).—The twenty-fifth report of this Company states that for the year ending 31st December, 1913, the net profits, including the amount brought forward from the previous year, amount to $55,512.67. From this amount an interim dividend of $2 per share has already been paid, and after writing off directors' and auditor's fees, it is now proposed to pay a final dividend of $2.25 per share, making a total dividend for the twelve months of $4.25 per share, and to carry forward the balance, $1,837.67, to the credit of a new profit and loss account.

Hongkong Hotel Co., Ltd.—The profit for the year ended December 31, 1913, amounted to $200,258.72, which the board of directors recommended should be apportioned as follows:—

To pay a dividend of:—	
$7.00 per share on 12,000 old shares	$84,000.00
3½ per share on 8,000 new shares	28,000.00
To transfer to repairs and renewals account	25,000.00
" write off furniture and fixtures account	25,000.00
,, carry forward to new account..	38,258.72

China Fire Insurance Co., Ld.—The report of the directors for the year ended December 31, 1913, states:—

1912 Account.—This account shows a net profit on working of $341,403.07 which sum it is proposed to apportion as follows:—

Dividend of $7.00 and bonus of $3.00 per share on 20,000 shares	$200,000.00
To add to extra reserve Fund, which will then stand at $877,588.30 ..	135,013.17
Bonus to office staff	6,389.90
	$341,403.07

1913 Account.—The balance at credit of this account is $426,277.34

Yangtsze Wharf & Godown Co., Ld.—The report of the directors for the year ended December 31, 1913, contains the following:—

The year's working has resulted in a net profit of Tls. 28,135.52, to which the balance brought forward from 1912, Tls. 4,477.76 being added, the sum of Tls. 32,613.28 remains at credit of profit and loss account to be dealt with.

This sum it is proposed to appropriate as follows:—

	Tls.
write off on buildings, pontoons, etc.	5,000.00
write off on steam launch	1,500.00
to pay a dividend of 8 per cent. on capital of Tls. 250,000.00	20,000.00
and to carry forward	6,113.28
	Tls. 32,613.28

Siamese Tramway Co.—The report of the Directors of the Siamese Tramway Co. Ltd. for the year ending December 31, 1913, was as follows:—

Total receipts	Tcs.		324,467.07
Expenses	,,		226,175.03
Leaving a gross profit for the year of	Tcs.		98,292.04
which after deduction of interest Account ..	Tcs.	2,508.76	
Loss on Stock	,,	149.00	
Debenture Interest ..	,,	38,991.06	
Depreciation	,,	45,000.00	
	Tcs.	86,648.82	
leaves a net profit of..	Tcs.		11,643.22
added to which the balance from last year..	,,		468.76
which makes a total at the disposal of the Company of ..	Tcs.		12,111.98
it is proposed to distribute this as follows:—			
3 per cent. balance of dividend for 1912 on 1,000 Preferred Shares	Tcs.		3,000.00
8 per cent. Cumulative Interest on Tcs. 3,000.00 for 1913 ..	,,		240.00
8 per cent Dividend on 1,000 Preferred Shares for 1913 ..	,,		8,000.00
and to carry forward	,,		871.98
	Total Tcs.		12,111.98

Union Insurance Society of Canton, Ltd.—The balance sheet of the Society on the 31st December, 1913, and a statement of accounts to the same date were as follow:—

1912 Account.—After payment of the interim dividend of $30 per share and the bonus of 20 per cent. to Contributors passed at the last annual meeting, there remained a balance of $966,142.11.

The Board recommended that this sum be appropriated as follows:—

A final dividend to shareholders of $20 per share on 12,400 shares ..	$248,000.00
An addition to the Sterling Reserve Fund of £25,000 at Exchange 1s. 11½d.	258,064.52
To be carried forward to Underwriting Suspense Account to close the account for the year 1912 ..	460,077.59
	$966,142.11

Laou—Kung—Mow Cotton Spinning and Weaving Co., Ld. (Shanghai.)—The report of the general managers. Messrs. Illbert & Co., Ld., contained the following:—

The balance at credit of profit and loss account at the close of the year, including Tls. 6,455.99 brought forward from 1912, amounts to Tls. 158,623.54 which the directors recommend be dealt with as follows:—

	Tls.	Tls.
To pay a dividend of Tls. 12.00 per share on 8,000 Shares........................		96,000.00
To depreciation of mill buildings........................	9,339.14	
To depreciation plant and machinery	32,268.77	
To depreciation furniture.	250.00	
To depreciation and improvements	1,000.00	
		42,857.91
To 10 per cent. commission on Tls. 109,309.64 (being Tls. 158,623.54 less balance of 1912 account Tls. 6,455.99 and proposed depreciation of Tls. 42,857.91) to the general managers in accordance with their agreement		10,930.96
To be carried forward to new account		8,834.67
		Tls... 158,623.54

Hongkong and Whampoa Dock Co. Ltd.—The report and balance sheet for the year ended 31st December, 1913 states that the Gross Profit for the year is $391,038.02

Which, after paying Bank Interest	$122,547.10	
Depreciating Plant and Buildings by	76,005.77	
And providing for a possible loss on sale of the Dredger "Canton River" of	40,000.00	
		$238,552.87
Leaves a net profit of........................		$152,485.15
And adding amount brought forward from last account.........................		40,911.92
Leaves available a sum of................		$193,397.07

Which the Directors recommended should be appropriated as follows:—

To pay a dividend at the rate of 6 per cent. per annum or $3 per share...	$150,000.00	
Carry forward to new account	43,397.07	
		$193,397.70

Hongkong Ice Co., Ltd.—The report for 1913 stated:—Including $8,335.88 brought forward from the previous year, and after deducting $10,000 paid as an interim dividend of $2 per share on August 18, 1913, the balance at credit of profit and loss account was $37,356.12, which it was recommended should be appropriated as follows:—

A Final Dividend of $7 per share ..	$35,000.00
To carry forward	2,356.12
	$37,356.12

FINANCIAL

The Banque Industrielle Loan.—According to a Peking paper the salient features of the prospectus of the Loan issued in Paris on April 7 were as follow:—

The Loan is known as the Five Per Cent. Gold Industrial Loan of the Government of the Chinese Republic of 1914. The authorized amount is Fcs. 150,000.000, of which Fcs. 75,000,000 is to be issued on this occasion. The loan has been authorized by the President of the Chinese Republic, his authorization having been officially notified to the French Minister at Peking on October 28, 1913.

The amount derived from the present issue is to be used for "public works," it being understood that the first of these works to be undertaken are:

1. The construction of the port of Pukow on the Yangtze (opposite Nanking).
2. Municipal works to be undertaken in the city of Peking (tramways, electric lighting, waterworks, etc.)

Guarantees: The Loan will be specially secured upon:

1. The construction works mentioned above, their *materiel,* buildings and products.
2. The municipal taxes of Peking, present and future (octrois excluded.)
3. By the alcohol taxes in the provinces North of the Yangtze, officially estimated at Tls. 4,000,000 (about 14,000,000 fcs).

The concession of these special securities was officially notified to the French Minister at Peking on March 12, 1914.

Furthermore, in case the security above-mentioned proves insufficient the interest and capital of the loan are further secured by the general revenues of the Chinese State which recognizes the loan as a direct obligation.

The present issue consists of 150,000 5 per cent. Gold Bonds of Fcs. 500 each. These Bonds bear an annual interest of Fcs 25, payable in two half-yearly instalments of Fcs. 12.50 on March 1 and Sept. 1 each year, with the exception of coupon No. 1, due on September 1, 1914, the instalment on which will be Fcs 10.416.

The Bonds are free from all Chinese imposts.

The repayment of the loan will be by 35 annual drawings, beginning on March 1, 1930 Between 1924 and 1934 amortization may be accelerated, but in such case the Chinese Government will redeem each Bond for Fcs. 512.50.

The Issue price will be 94¼ or Fcs. 471.25 per Bond, payable, Fcs. 100 on subscription, and the balance on allotment. At this price the Bonds will yield 5.30 per cent., excluding the price of redemption.

Subscriptions will take place on April 7 at the following institutions in Paris: The Banque Industrielle de Chine, the Credit Français, and the Société Centrale des Banques de Province. In the provinces subscriptions will be received by all Stock Brokers, Bankers, and members of the Syndicat de Banques de Province.

If subscriptions exceed the authorized issue, applicants will only receive a proportionate amount of Bonds.

Provisional Certificates, to which will be attached an interest coupon for the instalment due on September 2, 1914, will be sent to subscribers at once, and replaced later by regular Bonds.

The prospectus, of which the original bears the signature of the French Minister at Paris contains the following additional particulars:

The loan is for a period of fifty years from the date of issue.

Amortization will commence on March 1 of the sixteenth year, i.e. on March 1, 1930.

The sums necessary for amortization will be paid by the Chinese Government in two equal half-yearly instalments.

Amortization will be effected by drawings.

These drawings will take place on January 15 of each year (except the first fifteen years) in accordance with the amounts stipulated in the amortization table. The repayment of drawn bonds will be begun on the following March 1.

The Chinese Government reserves to itself the right after the expiration of ten years from the date of issue (i.e. from 1924) after giving six months' notice of such intention, to redeem at any time, in whole or in part, the Bonds of this loan, subject to an additional premium of 2 ½% in case of amortization being effected before the twentieth year (i.e. before 1934).

After the twentieth year (1934) it can effect amortization without any premium.

Additional amortization will be effected by supplementary drawings, which will take place at the same time as the ordinary drawings.

Drawn Bonds will bear no further interest from the date on which they are repayable.

Bonds which are not presented for redemption within thirty years from the date on which they are repayable, will become the property of the Chinese Government.

Appended to the prospectus is a letter from the French Minister of Foreign Affairs to the Banque Industrielle notifying the latter of the receipt from the Chinese Minister in Paris of an official notification of the securities set aside for the service of the new loan.

INSURANCE

Venus Life Insurance Co., Ltd, (Shanghai).—On April 2 this company was inaugurated at 6 A, Hongkong Road, Shanghai. The company has a capital of $1,000,000, of which a quarter is paid up. Mr. Tang Shao-yi is chairman of the board of directors, the vice-chairman is Mr. Lu Sing, and the others are Dr. Wu Ting-fang, Lord Li Ching-fang, Messrs. Yang Tcheng, Tang Wên-sze, Zao Wen-chang, Wong King-fang, Wen Tsung-yao, Ting Pao-chi, Li Mer-tsi, Sung Zong-ying, Pang Kuong-ying, Yi Tseu-chien, managing director, and Chang Bing-foo, sub-managing director. Mr. J. Trevor Smith has been appointed inspector of agents.

While the company has been incorporated in Peking, it is the intention to have it likewise registered in Hongkong. Everything, it is the intention, will be conducted on foreign lines, and policies will be printed both in Chinese and English.

MINING

Kailan Mining Administration. — The total output of the Administration's mines for the week ended February 21, amounted to 49,906.11 tons and the sales during the same period to 54,831.13 tons.

Week ended February 28, output 54,992.86 tons, sales 60,206.31 tons.

Week ended March 7, output, 56,252.50 tons, sales 50,361.92 tons.

Week ended March 14, output, 60,891.88 tons, sales 49,606.18 tons.

Week ended March 21, output 60,096.32 tons, sales 65,024.66 tons.

Week ended March 28, output 60,950.81 tons, sales 59,144.46 tons.

Australian Dredges For Malaya.—The contract for the construction and erection of two large bucket dredges—at a total cost of £40,000—for equipping the property of the Kampong Kauranting Tin Dredging Company, in the Malay States, a concern managed from Sydney, has been placed in Melbourne. The specifications and design are the work of Mr. J. S. Henry, and the dredges contracted for will, it is officially stated, be easily the largest ever built in Australia. The material and workmanship will be as far as possible Australian. The latest improvements found necessary as a result of tin dredging experience in Malaya, including the most recent type of revolving screen, will be fitted in these dredges. Large tin saving tables are another feature—the pontoon being specially large—viz. 130 ft. by 44ft. by 8¼ft. deep to carry them. The dredges will be fitted with close connected 6ft. buckets, which will have a theoretical capacity of 35,000 yards per week for each dredge, and effective capacity of 20,000 to 25,000 yards of tin-bearing material per week. The plant specified is designed to dredge 45 ft. below water level. The main engine is of 120 brake h.p., and the pump installed for sluicing has a delivery of 6,000 gallons of water per minute. The cost of the two dredges erected and in good going order on the mine, together with the spares, tools, tin dressing sheds and buildings, will exceed £40,000. The total weight of the dredges, with machinery, will be over 625 tons, which is considerably over 100 tons heavier than the largest dredge yet sent from Australia to the East. The contract time for delivery for the first dredge is eight months, and for the second eleven months from the date of signing the contract.

Malaguit Dredging Co.—This company's new five-foot bucket dredge has begun operations in the Paracale mining district under the supervision of Mr. J. A. Bruce.

Gold Ore Refinery for Chosen.—The *Seoul Press* reports that Mr. Fusano Hisahara, a Japanese capitalist, intends to establish a gold ore refinery at Pyongyang, Chosen (Korea) for the treatment of low grade ore. A similar enterprise maintained by the owners of the Hidachi Mine is in a promising state, and it is expected that should the refinery of Mr. Hisahara be established, the mining interests in Chosen will profit greatly by it in view of the fact that both Japanese and Korean miners on account of comparatively small capital are wasting by no means inconsiderable quantities of gold through the adoption of crude refining methods.

China's Coal Oil Deposits.—According to a report by Hsiung Hsi-ling there are twenty-three coal oil deposits in the Province of Chihli, seventeen in Yunnan, thirteen in Kueichou, eight in Shensi, five each in Kiangsu and Kwangsi, four each in Shansi, Hunan and Fengtien, three in Szechuan, two each in Kirin and Hupeh, and one in Kwangtung, a total of 91.

Seoul Mining Company.—The final dividend of the Seoul Mining Co., for 1913, which was distributed on April 30, 1913, was a further 25 per cent. This makes a total of 50 per cent. for the year.

PERSONAL

The selection of Mr. A. G. Cox, M. I. C. E., as Engineer-in-Chief of the British section of the Hukuang Railways (the section between Wuchang and the Kwangtung frontier) is an eminently desirable one in every way. Mr. Cox has the longest service of any engineer on Chinese railways, and practically twenty years of it have been spent with the Peking-Mukden line, where he has held the position of Deputy Engineer-in-Chief for some years. Mr. Cox takes with him to his new post a complete knowledge of conditions, great capability, and a reputation for integrity and uprightness which is respected by Chinese and foreigners alike. The aim of Mr. Cox will be to build a railway efficiently and economically, and it will be regrettable if he is in any way obstructed in this desire. Mr. Cox has taken up his duties, having relieved Mr. Collinson, the former Engineer-in-Chief, who has left the service of the Chinese Government.

Mr. A. W. U. Pope, C. I. E., has retired from the service of the Chinese Government.

Mr. Harry T. Edwards has been appointed chief of the Philippines Bureau of Agriculture.

Mr. J. W. Gallagher returned from America in April and resumed charge of the office of the United States Steel Products Company in Shanghai. During his absence Mr. W. H. Dietrich was in charge.

THE GOVERNMENT OF THE PHILIPPINE ISLANDS
DEPARTMENT OF FINANCE AND JUSTICE
BUREAU OF CUSTOMS, MANILA

Bids will be received by the Insular Collector of Customs, Manila, P. I., until twelve o'clock noon, July 1, 1914, for the following vessels:

1. The Cutters **"Busuanga," "Tablas," "Palawan," "Luzon," "Panay," "Mindanao," "Mindoro," and "Negros."** These cutters have a gross tonnage of 411.11, length 148 feet, are single screw composite seagoing steam vessels, speed 10½ knots, I. H. P. 500.
2. The twin screw steam vessel **Scout**, gross tonnage 301.33, length 136 feet.
3. The seagoing launch **Sora**, gross tonnage 51, length 90 feet.
4. The seagoing launch **Skua**, gross tonnage 51.13, length 83 feet, 5 inches.
5. The steam launch **Guy Howard**, length 77 feet.
6. One Mullens' auto boat, length 26 feet. Four cylinder Mullens' engine rated at 40 H. P.
7. The gasoline launch **Merlin**, gross tonnage 16.58, length 57 feet, 100 H. P. Speedway engine.
8. Launch No. 3, gross tonnage 17, length 51 feet.
9. The steam launch **Tagalog**, gross tonnage 6.02, length 36 feet. Navy Type cockpit launch.
10. Two ketches, gross tonnage 46.14, length 65 feet, equipped with auxiliary power 45 H. P. Meitz & Weiss kerosene engines, ketch rigged.

Bids must be accompanied by ten per cent. of the sum thereof in the form of cash or an accepted check. The right is reserved to reject any and all bids.

Specifications may be obtained and blue-prints examined at the office of the Inspector of Hulls and Boilers, Manila Customs House, at the American Consulates in Shanghai, Amoy and Hongkong, China; Singapore, S.S.; and Melbourne and Sydney, Australia.

B. HERSTEIN,
Insular Collector of Customs.

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Jardine, Matheson & Co.
Arnhold, Karberg & Co.
Rendrock Powder Co.

Fan Blowers
Drysdale & Co.

Feed Water Heaters
Babcock & Wilcox Ltd.

Food Products
Anderson & Co., W. H.

Gas Engines
Melchers & Co.
Campbell Gas Engine Co., Ltd., The

Graphite Paint
J. Dampney & Co.

High Speed Engines
Drysdale & Co.

Hose
F. Reddaway & Co., Fire Hose "Sphincter Grip," Armoured Hose, etc.

Ice Machinery
Vulcan Iron Works
Melchers & Co.

Insurance
Stevenson & Co., Ltd., W. F.

Ironfounders
A. F. Craig & Co.

Life Insurance
China Mutual Life Insurance Co., Ltd.

Locks
Yale & Towne Mfg. Co.

Locomotive Speed Indicator and Recorder
Hasler Telegraph Works.

Lubricants
Albany Lubricating Co.

Lumber Dealers
Robert Dollar Co.
Jardine, Matheson & Co.

Machinery Merchants
Andersen, Meyer & Co.
Arnhold, Karberg & Co.
Shanghai Machine Co.
Fearon, Daniel & Co.
Frank L. Strong
Schuchardt & Schutte.
Shanghai Dock & Engineering Co., Ltd.
Samuel & Co., Ltd.
Tulloch & Co.

Mechanical Rubber Goods
F. Reddaway & Co.

Mill Machinery
Rose Downs & Thompson Ltd.
Shanghai Dock & Engineering Co., Ltd.
A. F. Craig & Co., Ltd.

Mining Machinery
Melchers & Co.
Shanghai Dock & Engineering Co., Ltd.
Shewan, Tomes & Co.

Mineral Oil Plants & Machinery
A. F. Craig & Co.

Motors
Shanghai Dock & Engineering Co., Ltd.
Pratt's

Motor Tyres
F. Reddaway & Co.

Motor Launches
Shanghai Dock & Engineering Co., Ltd.

Paints Oils and Varnish
Standard Oil
Albany Lubricating Co.
F. A. Vander Loo & Co.
J. Dampney & Co.

Packings
F. Reddaway & Co.
Greene Tweed & Co.

Pulleys (Steel)
Schuchardt & Schütte
Shanghai Machine Co.
Shanghai Dock & Engineering Co., Ltd.

Pumps
The Goulds Manufacturing Co.
Shewan, Tomes & Co.
Jardine, Matheson & Co.
Shanghai Machine Co.
Shanghai Dock & Engineering Co., Ltd.
Joseph Evans & Sons

Railroads
Chinese Government Railways
Manila Railroad Co.
South Manchuria
Southern Pacific Co.
Chosen (Korea) Railways.

Railroad Supplies
American Locomotive Co.
Andersen, Meyer & Co.
Arnhold, Karberg & Co.
Baldwin Locomotive Work.
Fearon, Daniel & Co.
Hannoversche Maschinenbau A. G. Vormals Georg Egestorff.
Henschel & Sohn.
P. Herbrand & Co.
Jardine, Matheson & Co., Ltd.
Melchers & Co.
Shewan, Tomes & Co.
Shanghai Machine Co.
Shanghai Dock & Engineering Co., Ltd.
Tyer & Co.
U. S. Steel Products Co.
Railway Signal Co., Ltd., The
Robert Dollar Co.
Samuel & Co., Ltd.
Dick, Kerr & Co., Ltd.
Siemssen & Co.

Reinforced Concrete Construction
Shanghai Dock & Engineering Co., Ltd.
Trussed Concrete Steel Co.
U. S. Steel Products Co.

Roofing Paper
California Manila Lumber Commercial Co

Rope Manufacturers
Johnson-Pickett Rope Co.
U. S. Steel Products Co.
Ynchausti & Co.
Shewan Tomes & Co.

Ship-Chandlery
Ynchausti & Co.

Shipping Agents
Cia. General de Tabacos
Shewan, Tomes & Co.
Stevenson & Co., Ltd.

Shipbuilding and Repairs
Fiat-san Giorgio Ltd.
Tsingtauer Werft
Hongkong & Whampoa Dock Co., Ltd.
Mitsu Bishi Dock and Engineering Works
Shanghai Dock and Engineering Co., Ltd.
The Taikoo Dockyard and Engineering Company of Hongkong, Limited

Steamship Companies
Cia. General de Tabacos
Pacific Mail S. S. Co.
Ynchausti & Co.
Toyo Kisen Kaisha.

Steel Manufacturers
United States Steel Products Export Co.

Steel Works
Bohler Bros. & Co., Ltd.
U. S. Steel Products Co.

Stokers
Babcock & Wilcox Ltd.

Structural Steel
Bohler Bros. & Co.
Shanghai Dock & Engineering Co., Ltd.
U. S. Steel Products Co.

Sugar Machinery
A. F. Craig & Co.

Superheaters
Babcock & Wilcox Ltd.

Tanks
Pacific Tank and Pipe Co.
Shanghai Dock & Engineering Co., Ltd.
U. S. Steel Products Co.
A. F. Craig & Co.

Telephones
The Western Electric Co.

Textile Machinery
A. F. Craig & Co.

Tiles and Bricks
Green Island Cement Co., Ltd.
Chinese Eng. Mining Co.

Tobacco Dealers
British-American Tobacco Co., Ltd.
Cia. General de Tabacos
Olsen & Co., Walter E.

Tools
American Tool Works Co.
Lodge & Shipley Machine Tool Co.
Shanghai Machine Co.
Shanghai Dock & Engineering Co., Ltd.

Windmills
Defiance Machine Works.

Water Softeners
Babcock & Wilcox Ltd.

Wood Working Machinery
American Tool Works Co.
Defiance Machine Works.
Lodge & Shipley Machine Tool Co.
Shanghai Dock & Engineering Co., Ltd.

THE FAR EASTERN REVIEW

COMMERCE :-: ENGINEERING :-: FINANCE

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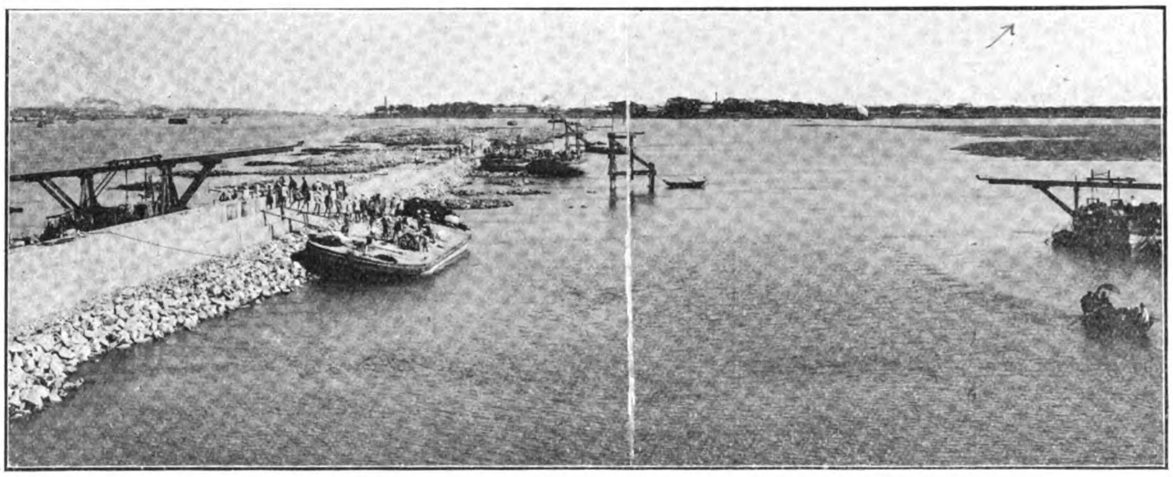
RANGOON RIVER TRAINING WORKS

SUCCESSFUL COMPLETION OF A GREAT PROJECT

Rangoon for a number of years lay under the shadow of a menace. As far back as 1879 silt and erosion were threatening to render the river useless for the navigation of craft of any size. By the completion of the Rangoon River Training Works on February 17, 1914, the shadow has been lifted, and the people of Rangoon are now assured that the city's position as third port of the Indian Empire will be maintained.

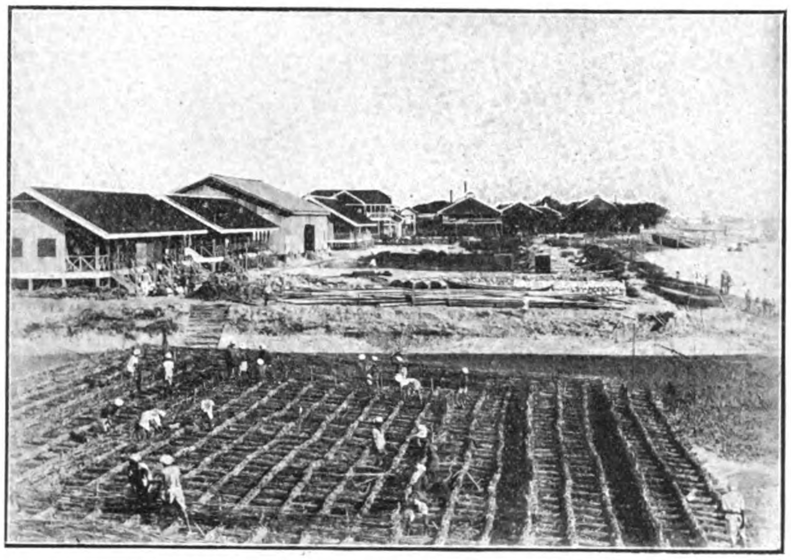
An extremely interesting description of the Training Works, well illustrated,* was published by our contemporary the *Rangoon Times*, and we are indebted to its columns for the material on which this article is based.

The Rangoon River is that on which is situated the town of the same name. It is formed by the junction of the Hlaing and Panhlaing Rivers, five miles above the town, and is joined by the Pazundaung Creek and Pegu River three miles below the town. The Hlaing—swift flowing, and short when compared with Burma's great river the Irrawaddy — rises in the Pegu Yomas. The Panhlaing is an off-shoot of the Irrawaddy, and the mean ebb discharge of the Rangoon River above the town throughout all tides during the year is about 300,000 cubic feet per second with a mean velocity of four feet per second. Immediately above the town and harbour the river takes a right angle bend, the course of the river being thus changed from one of North to South, to another of East to West. This change of direction so abrupt, has resulted in the erosion of the right or concave bank, and the formation of a deep embayment. There is no record to show when the erosion or scouring out process on the Seikgyi side of the bend commenced. Probably it began about the early fifties. At any rate a plan of the Rangoon River in 1824 shews the river of the normal width. In the opinion of Mr. G. C. Buchanan, C.I.E., M.I.C.E., the Chairman and Chief Engineer of the Rangoon Port Trust, there was at one time a great deal more water flowing down the Panhlaing Creek than at present, and the resultant force caused by the junction of the Hlaing and Panhlaing Rivers infringed on and eroded the left bank until an obstacle was encountered. The main stream was then diverted to the right bank where it found an easily eroded material, and steady erosion has continued to the present time. The erosion was, however, prevented from creeping down stream further than it has done by a projecting spur of stiff clay, known as Mower's Point, which the proprietor has for many years protected by laterite revetment work and other measures. The results of this erosion have been that Rangoon's very existence as a port has been seriously threatened. The deep water channel above Rangoon has been diverted year by year further away from the Rangoon foreshore and large sandbanks have formed on the Rangoon side of the river, immediately above the town. The ebb tide swinging around the eroded bend in a deep contracted channel has emerged from it at the projection known as Mower's Point with great force, and the momentum thus given to the water has carried it obliquely across the river to the Rangoon bank, causing erosion of the river bed, and the undermining of the Port Commissioners' wharves and jetties. The anchorage accommodation in a port peculiarly dependent on such has been seriously curtailed by the difficulty of laying many fixed moorings in a tideway subject to strong currents, and the impossibility of laying moorings of any description above Mower's Point. From time to time, since the constitution of the port authority in 1880, various engineers



Rangoon River Training Works: View near end of Wall showing the great width of the base and the building of the superstructure. The end of the wall is in comparatively shallow water and hence the base is visible. On the left of the photograph is the new channel with the Port of Rangoon in the distance and on the right is the old channel now silting up. The works were executed to prevent the river breaking through in the direction of the arrow at the top of the photograph.

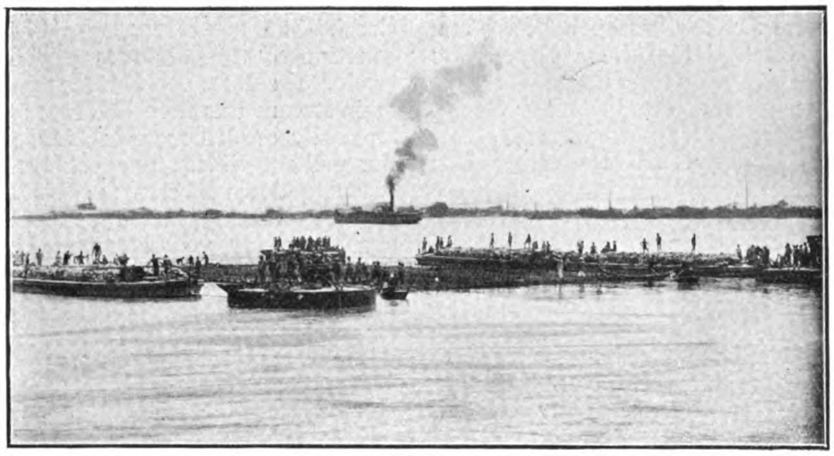
*We reproduce some of these illustrations by courtesy of the *Rangoon Times*.



Mattress on slip ready for launching.

have discussed, in an academic way, projects for bringing the river into train but it was always realized that in a great tidal basin varying from half a mile to a mile wide, situated in an alluvial plain with depths of water up to 80 feet below low water (ordinary spring tides) a 20-foot range of tide and currents on the flood and ebb running 4 to 6 knots per hour, any work carried out with a view to diverting the main channel of the river must necessarily be largely experimental and must present a possibility of failure.

Mr. Buchanan examined the conditions and issued a preliminary report in 1903. Mr. Meik, the well known expert on harbour and river works, accepted his conclusions. Eighteen months were employed in making a complete survey accompanied by tidal observations, and in December 1905 a scheme was prepared and presented to the Port Commissioners. The scheme was supported by the Local Government and in due course reached the Government of India. At their instance a Committee was appointed to consider it, presided over by Sir John Benton, the Inspector-General of Irrigation for India, with whom was associated the late Mr. J. R. Bell, the expert on Indian rivers. The Committee issued its report in 1906. In it the principle of a training wall proposed by Mr. Buchanan was agreed to.



A mattress in position ready to be sunk through 70 feet of water.

The training wall was agreed to by all, but experts differed as to the way in which it should be constructed. Mr. Buchanan had recommended that it should be laid on mattresses. Sir John Benton's Committee recommended that it should be built on a stone or laterite floor. A lengthy discussion ensued which lasted for four years. In the course of it Mr. Buchanan fortified his opinion by a foreign tour in which he studied on the spot the river improvement works of the United States, Canada, and China. But he failed to convince the other side. And so the controversy rolled on, Mr. Buchanan affirming that the work could not be carried on without mattresses, and Sir John Benton as stoutly asserting that they were a positive danger. The contention was in full swing when Sir Harvey Adamson, the Lieutenant Governor, arrived in Burma in 1910, and neither the Government of India nor the Government of Burma in their attempts to attain harmony had succeeded in inducing either of the great protagonists to budge one jot from his originally expressed views.

Meanwhile, pending settlement of the mattress question, sanction to the estimate was being withheld by the Government of India. Sir Harvey Adamson visited the training works, examined the whole project, saw a mattress successfully laid, consulted his own Chief Engineer, and came to the conclusion, for what it was worth, that the work was progressing on proper lines, and that he should trust to Mr. Buchanan, the man on the spot. He represented these views to the Government of India, and urged that there could be no progress until the controversy was brought to a peremptory conclusion. The Government of India accepted his views, and sanctioned the estimate, mattresses and all. Since that time Mr. Buchanan carried out his project without interference, and the results showed conclusively that his tenacity of purpose was justified, and that the decision to adhere to mattresses was right.

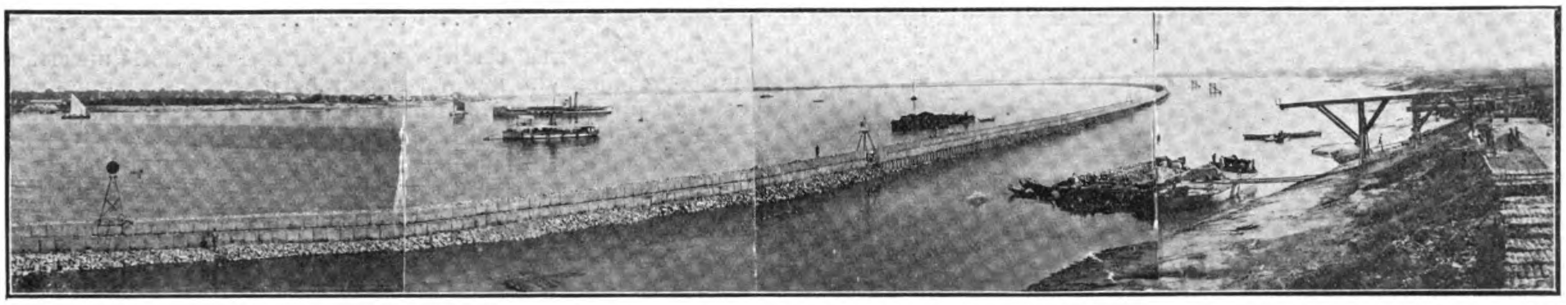
It was in October, 1910, that the approval of the Government of India was received for a wall with mattresses, and an estimate was sanctioned amounting to Rs. 1,34,10,607, subsequently amended in 1912 with the sanction of the Government of India to Rs. 1,50,00,183, or a million pounds sterling. The sanctioned work comprised a training wall 10,000 feet long extending from Seikgyi to within 2,000 feet of Mower's Point, and the dredging of a channel through the shoal in front of the wall. The top of the wall was to be 5 feet above L. W. O. S. T. which coincides approximately to low water of neap tides, it being considered that for the purpose of training the river this height of wall would be sufficient.

As the work progressed unforeseen problems in hydraulics arose, and it was found that effectively to control the river the height of the main wall should be increased and the deep holes scoured by eddies between the end of the wall and Mower's Point filled in to the normal level of the river bed in the vicinity. The height of the finished wall is now 14 feet above L. W. O. S. T. and it is calculated that 99½ per cent. of the river is brought under control, whilst the filling in of the deep holes will induce the stream lines of the flood and ebb tides to flow in parallel lines. The removal of the point itself is a work that will have to be carried out as circumstances permit, and the wall has been aligned with that end in view.

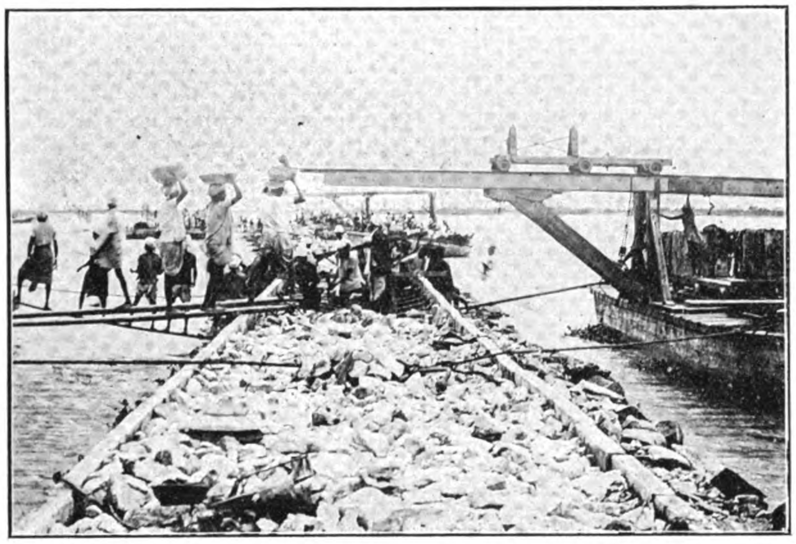
Sinking a mattress.

The wall is constructed of rubble stone dumped from steam hoppers or deposited from barges on a foundation of brushwood mattresses overlaid with rubble uniformly distributed, and the width of the foundation course throughout the wall is 235 feet. Upon the rubble mound is erected the superstructure which is built of reinforced concrete slabs forming the sides of the wall tied together by iron rods and filled in with stone. Of these slabs there are 15,750, and they were manufactured by the Commissioners' workmen at Seikgyi. Brushwood mattresses were used with the idea that by sinking a wide flexible carpet of this material for the whole length of the wall on the top of the soft silt forming the river bed the deposit of evenly distributed layers of stone to form the wall and apron would be facilitated.

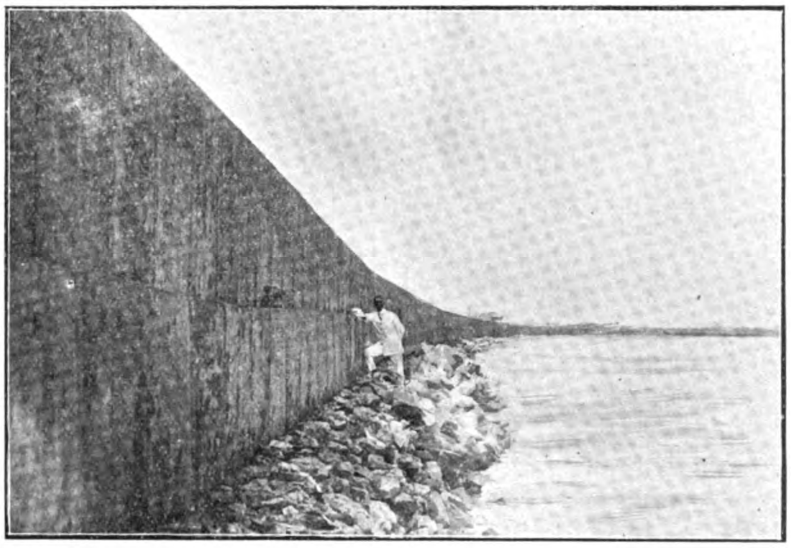
One and a half millions tons of granite have been used in the work, and the provision of stone of suitable quality and in sufficient quantity has been a leading feature of the project. A large granite quarry was opened out at the uninhabited island of Kalegouk, situated 135 miles from Rangoon in the open sea off the Tenasserim coast, but the task proved a most arduous one and many difficulties arose. The rainfall is between 200 and 260 inches per annum, the island was covered with thick forest and jungle, labour was difficult to obtain, and the sea passage to Rangoon in the monsoon so bad as to be at times dangerous. The output of the quarry was 1,000 tons per day and the stone was conveyed to Rangoon in steam hopper barges each of 1,000 tons capacity, specially built for the purpose.



Rangoon River Training Works: View looking down wall. On the left hand is seen the new channel with a stone barge in the foreground.



Construction of Superstructure

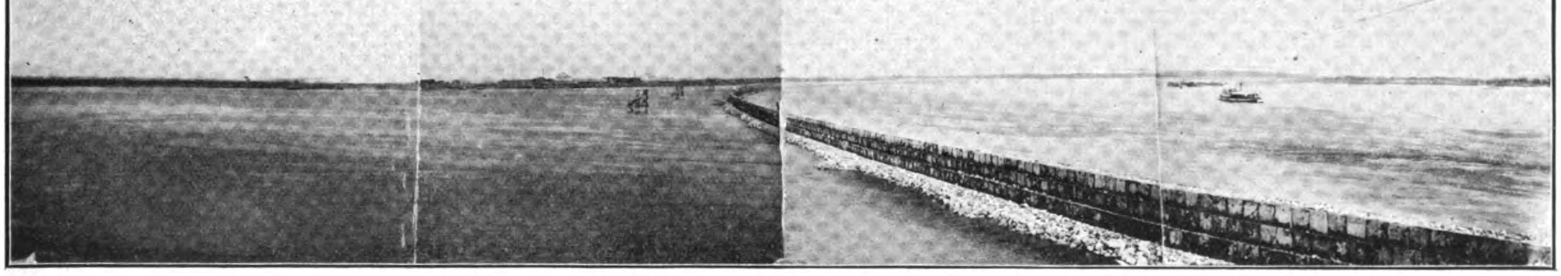


The finished wall showing superstructure above low water.

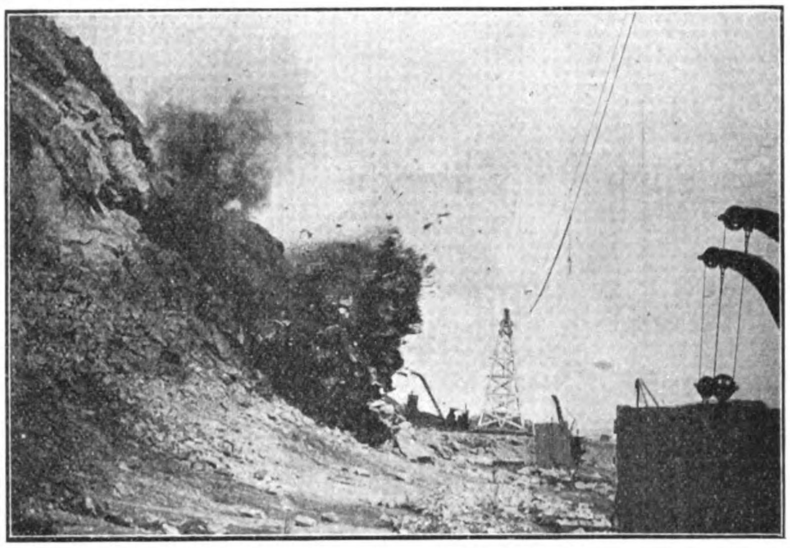
In the manufacture of mattresses 5½ million bundles of brushwood and 53,000 bundles of stakes were used, the material being supplied from all parts of Burma. In all 225 mattresses, each mattress measuring 125 feet long by 75 or 60 feet broad, were laid in depths of water ranging from 30 to 60 feet, and although there were anxious moments the work was accomplished without a single serious mishap.

A subsidiary source of supply for small stone has been a quarry worked by the Commissioners at Zingyaik on the Pegu-Moulmein Railway,—the stone being brought to Rangoon by rail.

The dredging of the shoal in front of the wall has been accomplished by a powerful suction pump dredger capable of lifting 80,000 cubic feet of sand and silt per hour from a depth of 55 feet and of delivering it though a pipe line 3,000 feet long.

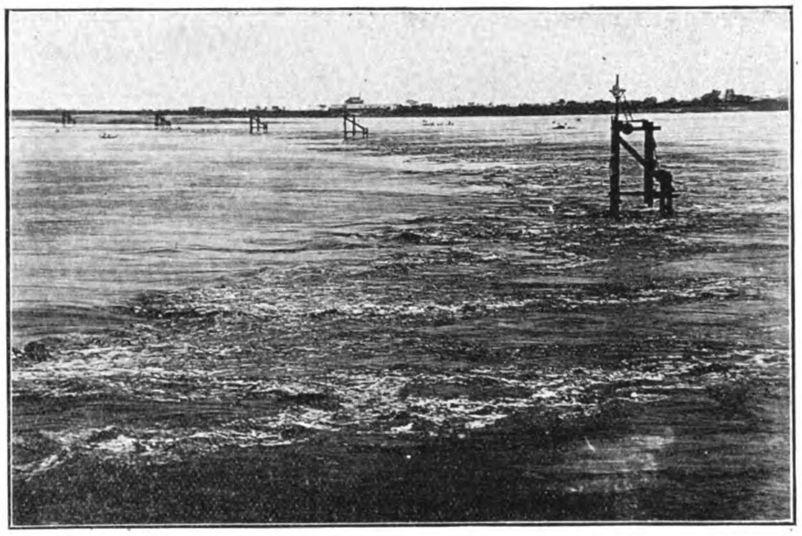


Rangoon River Training Works: A panorama looking upstream taken from about two-thirds of the way down the wall. On the left hand is the old deep water channel now silting up and comprising over 350 acres of land which will ultimately be reclaimed, and on the right is the new deep water channel.



A blast at the stone quarries on the Island of Kalagouk.

The estimated date for the completion of the work was December, 1915, but on two occasions the programme of operations has been accelerated, and the wall is now practically completed 1 year and 9 months before the estimated time. The object of the work has been successfully accomplished, the main channel of the river has been diverted into its new course, the erosion of the right bank has ceased, and the area, amounting to 300 acres, between the wall and the old foreshore is rapidly silting up.



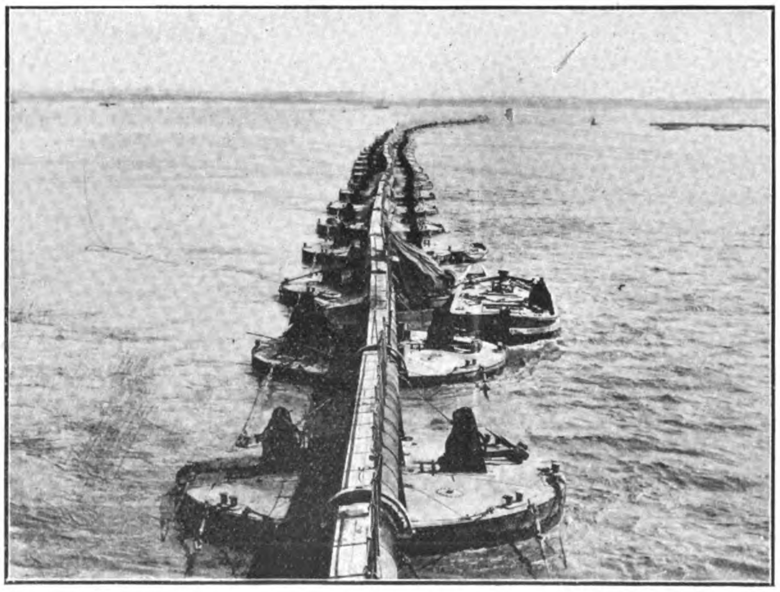
Influence of wall on deep water channel as construction proceeded.

The sanctioned estimate for the work, but for the wall without a superstructure, was Rs. 150 lakhs or £1,000,000; while the actual cost, including superstructure is Rs. 138 lakhs or £920,000 of which the various items are: Mattresses £103,000; dolphins and beacons £10,300; stone £335,800; capital cost of quarries and three steam hopper barges £171,400; equipment, launches, etc., £84,300; purchase of land £59,800; dredging plant £81,300; dredging £23,300; miscellaneous work £22,000; engineering and supervision £28,800; total £920,000 Rs. 1,38,00,000.) The saving is partly due to the efficiency of the mattresses which have become embedded in the river bed and prevented an anticipated settlement of the main wall and is partly due to the saving in establishment due to the work being finished so long before the estimated time. The cost of the work has been borne in part by a free grant of 50 lakhs of rupees from the Government of India which the Port Commissioners gratefully acknowledge, and for the remainder by the raising of Port Trust debenture loans. The work is non-revenue producing and will impose a burden of some 5½ lakhs of rupees per annum on the trade of the port, but the following figures giving the size and rapid growth of the port will shew that almost any expenditure was justifiable under the circumstances, because although experts have differed widely concerning details of construction, there has been no difference of opinion respecting the urgent necessity of the work:—

	1899-1900	1912-13
	Rs.	Rs.
Value of block at approximate cost	75,00,000	3,27,54,707
	Tons.	Tons.
Net registered tonnage of shipping entering the Port...	1,457,380	2,862,668
	Rs.	Rs.
Ordinary port revenue from rates, rents and dues	11,79,500	43,93,456
Value of trade in lakhs:—		
(*a*) Imports	913·34	2,361·51
(*b*) Exports	1,423·11	3,075·62

The work was carried out departmentally, its uncertain nature and liability to modification or even suspension rendering a contract impracticable, and it is believed that of its kind it is the largest river training scheme that has been attempted. On an average about 2,500 men have been employed throughout the period of the work.

Towards the end of his address delivered on the occasion of the formal declaration of the completion of the work the Lieutenant-Governor, Sir Harvey. Adamson said:—"In conclusion I may say a word about the prospects of the ultimate success of this work. Projects of river training of such magnitude can rarely be predicated as certain of success. There are so many unknown and unknowable factors in play that in the best laid schemes of this nature there is always a risk of failure. I think that it can safely be said to-day in respect of this work that the bogey of failure is a mere nightmare of the past. The mattresses have fallen and done their work as anticipated. The wall stands firm after having been subjected to the action of the tides for many months. Probing fails to reveal any defect in it. Silting behind the wall is progressing more rapidly than was expected and an area of 300 acres of most valuable land is in process of speedy reclamation. The main channel has been diverted into its new course, the erosion of the right bank has ceased, and the sandbanks above the town are rapidly disappearing. It can therefore be said with practical certainty that the work is firm and staunch and that it has achieved its object. The largest of river training schemes in any country has been successfully completed, and I venture to predict that Mr. Buchanan emerges from this magnificent project with a name which will rank among the greatest of river Engineers in the whole wide world."



Dredger pipe line 3,000 feet long discharging 4,000 tons per hour.

RAILWAY DEVELOPMENT IN SHANTUNG

A correspondent at Hsuchowfu writes to a contemporary as follows:—The chief items of interest in North Kiangsu at present are economic rather than political. It is hardly too much to say that even the great Lung Hai Railroad, stretching from Lanchowfu to tidewater, is eclipsed in importance by the new line to be built from some point west of Tsingtao, via Ichowfu, and terminating at this place.

It may not be clear how such a short line appears of more importance to this part of the province than the line that cuts straight across North China, with its infinite political possibilities: for the wise ones have pointed out that the Lung Hai is but the emergence of a great eastern-bound current that was dammed up effectually at Port Arthur and could not find sufficient space for dischange in the colder port farther north. But it is of far more importance to the short-sighted people that they should get a few commodities a fraction of a cent cheaper to-day than that the vitals of the nation should be helplessly exposed.

Neither may it be clear how the new road from Tsingtao to North Kiangsu can greatly affect prices, for its length will certainly not be very far from the present distance by rail from here to Shanghai, and in addition must be reckoned the very low freight rates on the Shanghai-Nanking Railway with which no line north of the river is likely to compete. But whatever may be the reason the trend of trade towards Tsingtao cannot be denied. It may be mentioned that one commodity has in the last few months established itself as almost a monopoly, although it has to pay freight over two hundred and fifty miles of the Shantung Railway and two hundred miles more over the Tientsin-Pukow line from Tsinan, and we are practically half way between the Yangtse and Tsinan. Shipments of the some commodity were just a little while ago entirely from the south, but they have practically ceased.

It is one of the failings of humanity to exaggerate the importance of one's own town, but making a liberal discount for such civic pride it cannot be denied that the possibilities of development here are tremendous. Already through the junction of the Tientsin-Pukow Railway and the Lung Hai, its importance has been increased by the change in the plans of the above mentioned new line from Tsingtao.

It will be recalled that the first plans made the terminus at the village of Hanchuang, just inside the Shantung border, from which place their trains would run into Hsuchowfu over the Tientsin-Pukow tracks. We understand that these plans have been materially modified and that the route will be direct from here to Ichowfu, which will put 30 miles of the road in the province of Kiangsu. For several years at least this city will be the eastern terminus of the Lung Hai. We hear that the officials of this road hope to have rails laid from Hsuchowfu by September but as they have, at this end of the line, neither rails nor cross ties that hope seems a little premature.

Steady efforts are being made to improve transportation on the Tientsin-Pukow Railway. A foreign traffic inspector is located here and a foreign conductor has been put on one of the regular trains.

An honour has been conferred on Mr. L. P. Ridgway by the Chinese Government in recognition of his services during the rebellion of last year. As District Engineer he had a very trying position as the opposing armies went back and forth over his section of the line inflicting no end of damage. President Yuan has conferred upon him the Chiaho decoration of the seventh class, an honour richly deserved. Mr. Ridgway has been on the railway from the start, stationed first near Pukow, later at Kuchen, where he built one of the important bridges, while now he is in charge of the line from the Shantung border south to Nanhsuchow.

Attention is directed to the new time table for the Tientsin-Pukow Railway which appears in our advertising columns. The express train will leave Tientsin each Saturday at 7.30 p.m. and will arrive at Pukow at 9.04 p.m. on Monday, while from Pukow the express will leave at 9.10 p.m. each Monday night and will reach Tientsin at 10.55 p.m. on Wednesday.

FREIGHT CHARGES IN AMERICA AND JAPAN

WITH LOWER COSTS JAPANESE ROADS GET HIGHER RATES

The American Bureau of Railway News and Statistics has issued the following:

"Although their railways pay the highest wages in the world and must face correspondingly higher prices for materials than are borne by any other transportation system, the American shippers to-day are paying a smaller bill to have freight transported than the shipper in Japan, whose railway, operated by the government, bears nearly, if not quite, the smallest burden in wages or costs of materials in the world. This striking showing of comparative economy is based upon the latest report of the Imperial government railways of Japan. The railroad system paying the highest labor costs of operation in the world, in other words, is selling its commodity, transportation, at a smaller price than is the most cheaply operated system on the globe.

"How little the question of cost burdens the Japanese railways may be learned from the fact that in the fiscal year ended March 31, 1912, it cost only $46 out of every $100 taken in to operate the system. In the corresponding fiscal year American railways paid in operating expenses a few cents under $70 for every $100 earned in gross. The difference in wages alone is almost enough to explain the discrepancy, for whereas American railways yearly pay out in wages more than $44 for every $100 earned, Japan's railways pay only $23, and whereas almost 64 per cent. of all operating expenses on American roads represents wages, less than 51 per cent. represents wages in Japan.

"In the face of this huge advantage the average rate per ton mile charged shippers on Japanese railroads is 0.83 cent against 0.74 cent on our own railroads. Yet the Japanese rate, unlike our own, does not cover terminal service. For this service a charge of 11.3 cents per ton is made, which, added to the road charge gives a total rate of 0.97 cent per ton mile against our own 0.74 cent.

"Although Japan affords a passenger rate of .69 cent per mile against our own 1.98 cent, the difference is almost wiped out by comparison of the traffic, for 95 per cent. of travellers on Japanese railroads are third class; only 4.7 per cent. use second class accommodations and three-tenths of one per cent. use first-class. Whereas this small number of first-class passengers pays 1.60 cents per mile, almost as much as our own, the third-class, in accommodations which would not be tolerated in this country, pays only 0.65 cent, which accounts for the low general average.

"Why the Japanese wage bill is so low may be judged from the fact that the highest paid officials, vice-president and engineer-in-chief, receive $200 a month. The average for officials of the higher grade is $166 per month and for officials of the lower grade $68 per month. Clerks receive an average monthly salary of $21, assistant engineers $26, general employees $9.70 and laborers in regular employ only $7.47. For all employees the average is only $112.50 per year against almost $750 yearly on American roads.

"Another reason why Japanese railroads have kept expenses so low is that immense amounts which on our own railroads must be met by operating expenses, there are charged to capital. The effect is seen in the capitalization figures, for whereas the cost per mile in 1908, just after nationalization, was only $47,759, by 1912 it had risen to $88,104, almost doubling the figures prevailing when the state took over the roads. Japan's railways to-day are capitalized at some $25,000 more per mile than those of the United States, frequently accused of over-capitalization."

The dry dock which is being constructed on Hikoshima, Shimonoseki Straits, by the Mitsu Bishi Company will be completed by November of this year. It will be 350 feet in length, 29 feet in depth, and 56 feet wide at the bottom, says the *Nagasaki Press*.

SCIENTIFIC INVESTIGATION IN THE PHILIPPINES

TWELFTH ANNUAL REPORT OF THE BUREAU OF SCIENCE

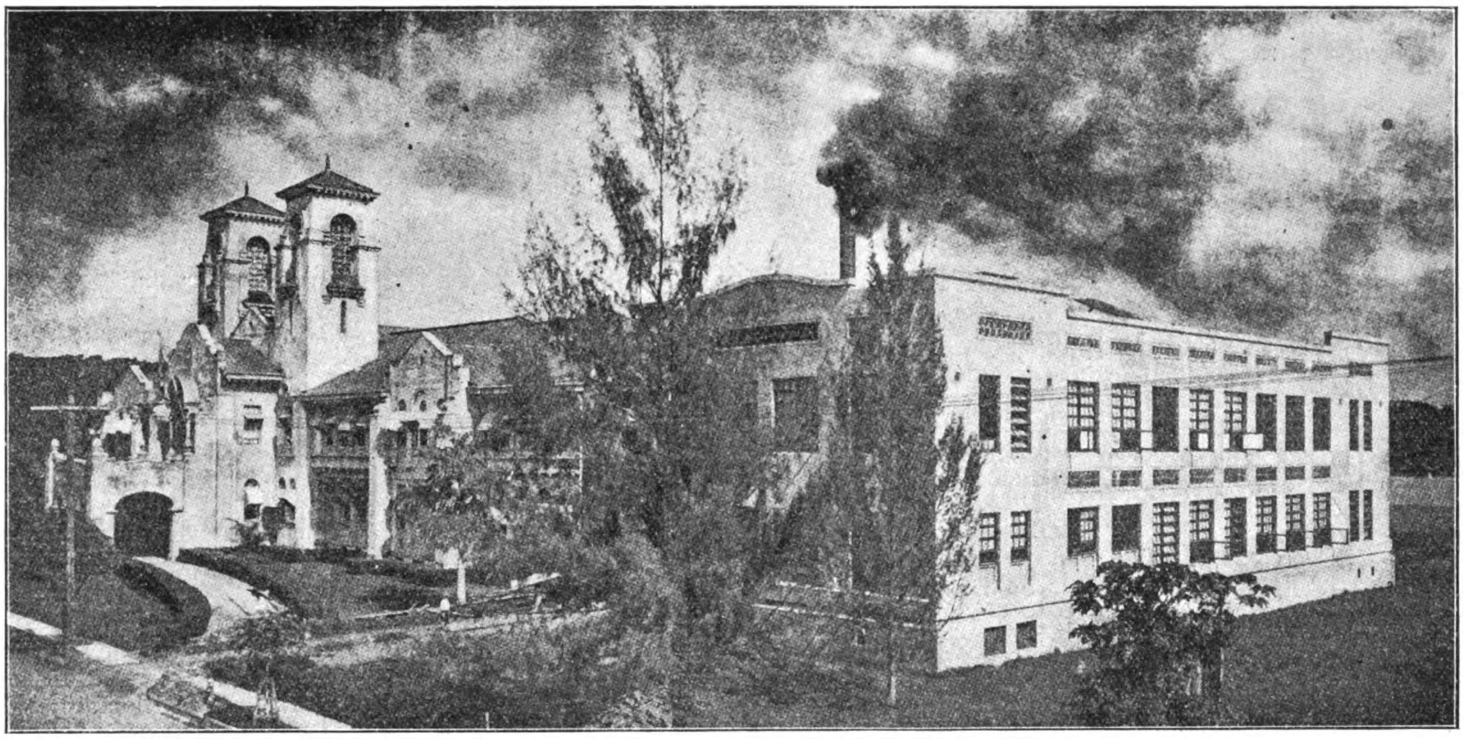
The twelfth annual report of the Bureau of Science, Manila, which has just been published covers the year ended June 30, 1913. Mr. Alvin J. Cox, the Acting Director, is to be congratulated upon maintaining the high level of excellence that has always characterized the reports of this Bureau.

Some idea of the usefulness and magnitude of the work being performed by the Bureau may be gleaned from the following extracts from the report:—

The Bureau of Science was established as the Bureau of Government Laboratories on July 1, 1901, by Act No. 156 of the Philippine Commission, although actual chemical and biological work was first begun on September 25 of the same year when it was started with 6 employees in a rented house on Calle Iris, Manila. The photographic collection, which has developed rapidly and now includes some 15,000 negatives, and other photographic work were begun with the employment of an official photographer on November 16, 1901. Entomological investigations began on December 9, 1902, and with them the foundation of the present entomological collection of specimens.

The present laboratory building of the Bureau of Science, which was added to in 1911, was first occupied early in the year 1905, and at that time the work was enlarged by the appointment of an engineering force and by the operation of steam and electric machinery. From this small beginning has grown the present power plant which supplies electric current, steam, gas, etc., to the Bureau of Science, the Philippine General Hospital, and the College of Medicine and Surgery.

The purchase of books of the library began soon after the organization of the Bureau, and this adjunct of the scientific work grew rapidly, necessitating the gradual enlargement of the force and the organization of the library staff. The original plan contemplated an expenditure of P.90,000 spread over a period of six years for sets of general periodical and other books on chemistry, geology, zoölogy, bacteriology, pathology, physiology, and general sciences. Books purchased with this fund together with the thousands of pesos' worth of publications which were received gratis formed the nucleus of the scientific library of the entire Government. The valuable material received

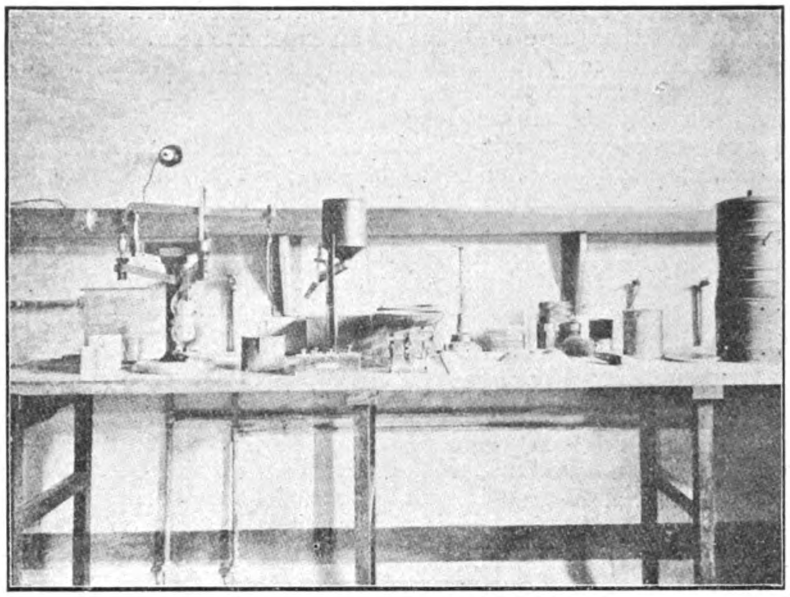


Main Building, Bureau of Science, Manila.

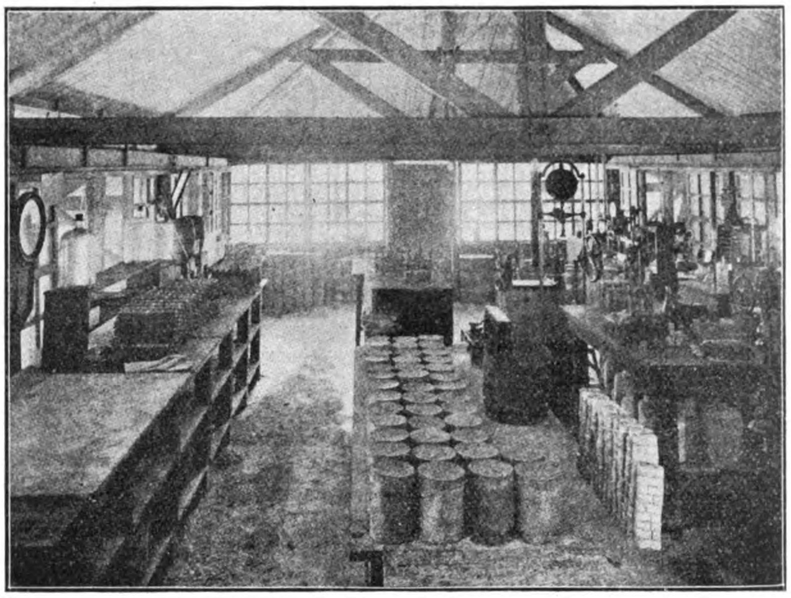
On January 1, 1903, the serum laboratory and the grounds at San Lazaro were transferred to the Bureau from the Board of Health. The section of botany which had been organized in the Bureau of Agriculture and the nucleus of the herbarium were added on July 1, 1903. On November 1, 1905, the Bureau of Mines ceased to exist and became an integral part of the Bureau of Science, and on November 1, 1906, the Ethnological Survey, formerly the Bureau of Non-Christian Tribes, which before that time had been incorporated with the Bureau of Education, was transferred to the Bureau of Science, and, as the division of ethnology, has undertaken the preliminary organization of the Philippine museum and has secured sufficient material to fil three-quarters of the space in the building assigned to it on Calle Juan Luna, one-quarter being reserved for the exhibit of the Bureau of Forestry. The collector of natural history specimens of the Ethnological Survey was transferred directly to the Bureau of Science (then Bureau of Government Laboratories) on November 16, 1904.

by gift and the continuations of sets purchased from current appropriations have been bound. These, together with the books and serial literature of the clinical principles such as surgery, skin diseases, and ophthalmology, which have been provided by the University of the Philippines, have been placed in the library.

Work made important by the needs of the Islands was from time to time added to the existing divisions. A cement-testing laboratory—including the testing of road materials and of concrete, sand, and gravel used in structural operations—and a laboratory for the examination of foods and drugs were developed within the division of chemistry. The serum laboratory, which at first had undertaken only the preparation of vaccine virus and small quantity of antirinderpest serum, increased its scope so as to cover all sera prophylactics used by the Civil Government. The biological laboratory, which had always been connected closely with the Civil Hospital and had done the general scientific work for the Board of Health,



Bureau of Science cement laboratory in 1906.



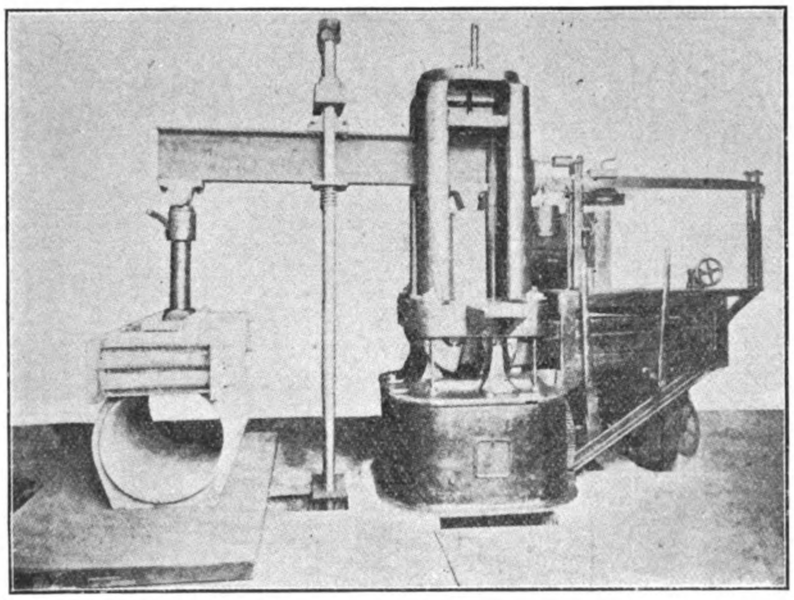
Bureau of Science cement laboratory in 1913.

undertook the diagnostic determinations for Bilibid Prison, for San Lazaro Hospital for contagious diseases, and, at a later date, a fair share of the teaching and hospital work belonging to the Medical School. Investigations in the provinces, bringing with them a more extended study of helminthologic infections, also eventually became necessary in order to give a clear understanding of the general condition of the people. Members of the staff are also in periodic demand by the Bureau of Health in conjunction with the collecting of lepers for the Culion Colony. In 1910 the Philippines Assembly established a Bureau of Science sugar-testing laboratory at Iloilo. On November 9, 1910, funds were transferred to the Bureau of Science by the Governor-General for the building of an aquarium in the bastion immediately in front of Real Gate of the city wall. On June 10, 1913, the aquaria and circulating system had been placed in operating condition by the Bureau of Public Works and were turned over to this Bureau.

There was one transfer from the Bureau of Science, namely, that of the serum herd to the Bureau of Agriculture on January 1, 1907.

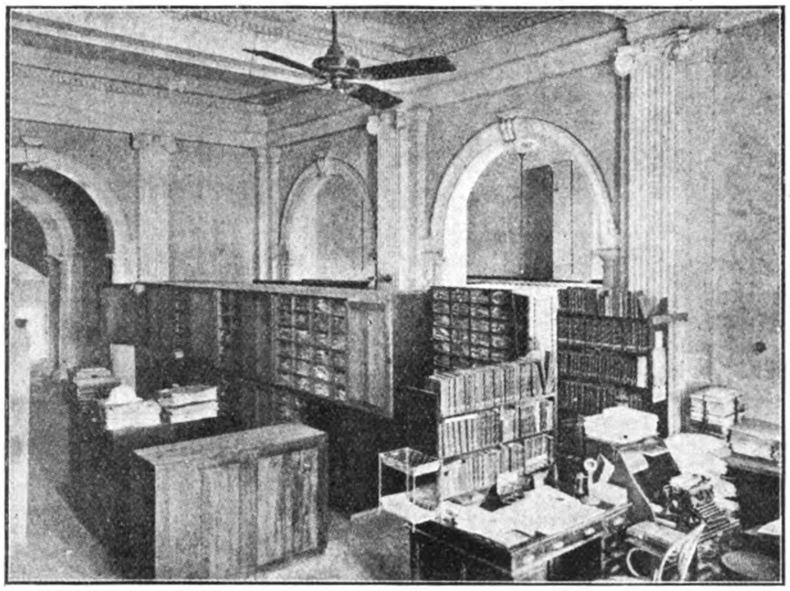
The Bureau of Science now has not only a local but an international reputation built up on the basis of the quality and volume of the scientific work which we have produced. In the course of the address given by those called upon to express His Imperial Majesty's the German Emperor's, views at the foundation of the Kaiser Wilhelm Institute for the prosecution of original research, attention was specially directed to the existence of a number of such institutions in America, and it was very gratifying to us to learn that the Philippine Bureau of Science was referred to as a great institution for investigation established by the Government.

The Bureau of Science performs a large amount of routine scientific work for many branches of the Government and for private parties. They are all benefited thereby, and the greater proportion of the results obtained have a permanent commercial value. In the tenth annual report of this Bureau, attention was called to the fact that in a single day the division of general, inorganic, and physical chemistry had carried on illumination tests of oil; heat insulation experiments; analyses of rocks, limestones and cements, water, soils, fertilizers, coals, and alloys; calorimetric determinations of fuels; standardizations of instruments of precision, of measures and of solutions; as well as physical tests of clays, cements, aggregates, road materials, textiles—such as puttees, khaki cloth, raincoats, and blankets—and of reenforcing iron and of rope. From this, which was done in one division, one can gain an idea of the variety of work carried on in a single day in the entire Bureau with its dozen divisions and sections. The analyses or examinations of samples of a given kind which are performed by the laboratory cannot often be segregated because with few exceptions they must be done promptly without waiting for others to accumulate.



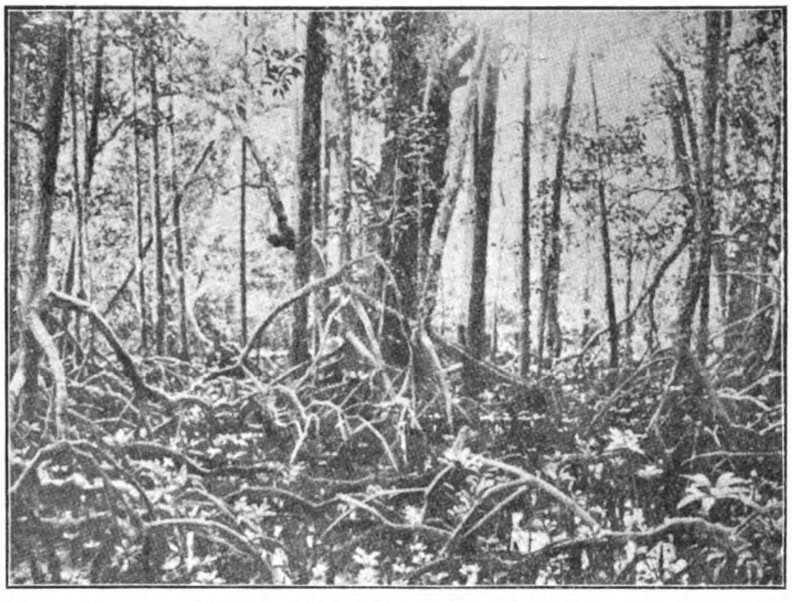
Testing machine breaking concrete pipes.

Silk-reeling exhibition at the Philippine Carnival



Interior of Herbarium showing type of cases.

Routine work does not prevent the Bureau from fulfilling its lawful function of conducting independent scientific research and working out the problems of economic importance, provided it be of a legitimate character. By a small nominal charge such as we make in most cases, we are able to exclude unimportant samples submitted out of curiosity and only of momentary interest; without such a charge we would be obliged to devote our entire time to routine work at the sacrifice of all our research work. The schedule of prices on the average does not cover more than the actual cost of routine analyses or examinations, on account of the extreme variety of the work. Certain types of analyses are made gratis exclusively for other branches of the Government, and in these cases it has been necessary only to approximate the cost for statistical purposes so the charges in the schedule may be more or less than the actual cost of the routine analyses or examinations. The charges for unusual and miscellaneous work are too low. The large variety of work makes economy of time difficult; the lack of room makes it imperative to disassemble apparatus as soon as work is completed instead of keeping it set up for similar work, as the space is needed for new work, and the irregularity with which requests are received interferes with the intertwining of suitable problems for research and investigations. The irregularity is partially overcome by enlisting the routine employees as secondary workers on investigations. The cost of performing routine work of a given class varies from time to time, depending upon conditions. In the United States a laboratory often secures a large amount of one class of work and can invariably employ cheap assistance and carry it on empirically. For instance, there are laboratories in the States where they do nothing but analyses of boiler water. In spite of their cheap labor, in almost every case their charges are higher than ours. Where the volume of any given class of work performed by the chemists, bacteriologists, assayers, or other employees is large, we are able greatly to reduce the unit cost and especially are we able to do so when we train and use the services of intelligent apprentices. At the present time we have an apprentice mechanical soil analyst, an apprentice milk analyst, and apprentice cement testers. Each of these is able to carry on a large part of the particular class of work independently and thus save the time of an expensive man. The cost of mechanical analyses of soils has been reduced between 50 and 75 per cent. As an illustration of how the price decreases with quantity, reference may be made to the history of our cement testing. In the fiscal year 1906 we tested fourteen cements; in 1907, one hundred eighty-five; in 1908, one thousand seven hundred nineteen; in 1909, three thousand five hundred ninety-six; in 1910, three thousand two hundred sixty-two; in 1911, three thousand seven hundred twenty-eight; in 1912, seven thousand nine hundred sixty-six; and during 1913 we tested more than nine thousand five hundred samples. In 1906 our authorized charge for cements was P30 per sample; in 1907, P15 per sample; and at the present time it is P0.60 for the same class of test. In the same manner, the cost of analyzing samples of water decreases rapidly when many samples are analyzed at one time. In the decreased cost of work with the increase in volume is to be found the strongest argument for the segregation of the scientific work of the entire Government in one institution like our own. Even when it is all brought together in one class, certain tests are so few in number that the unit cost of performing them becomes very high.

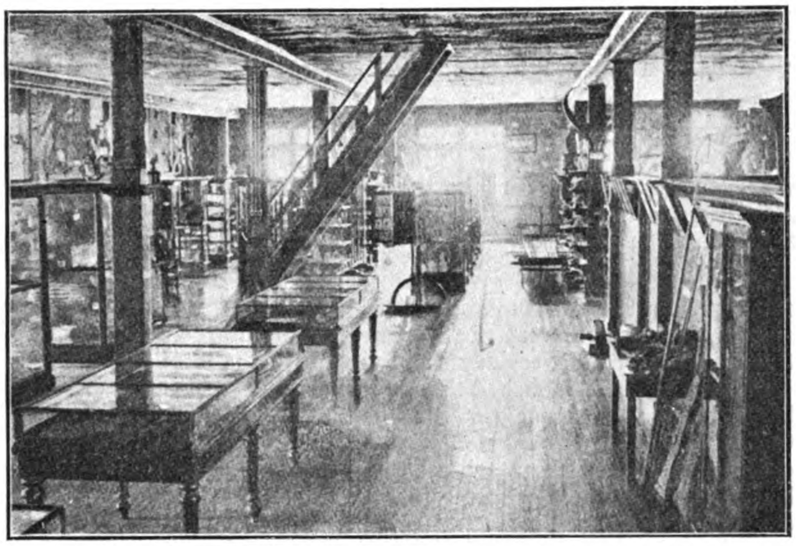


Interior view of a mangrove swamp.

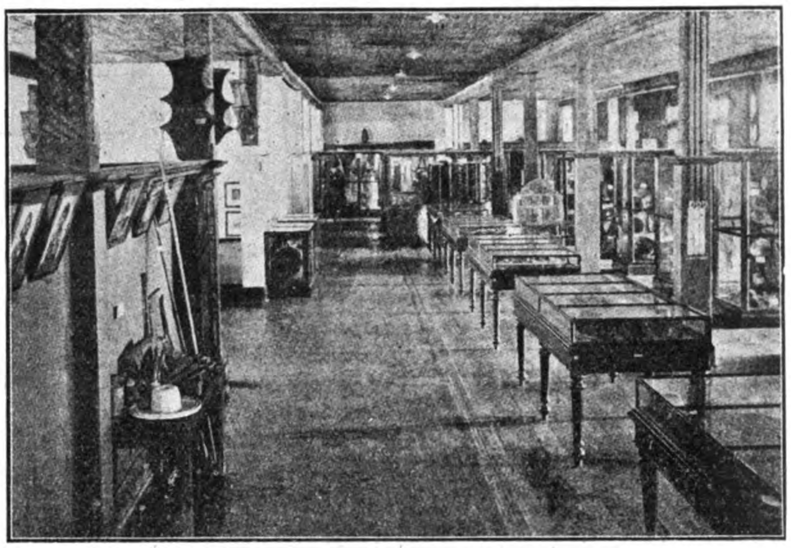
In general, people expect to pay more when work is done by a government laboratory because they have the prestige of the Government back of the results. We have avoided taking advantage of this as shown by the fact that our scheduled charges are consistently very much lower than the charges made by equally reputable commercial and other institutions or laboratories of the United States. Our continued effort is to be of as much assistance as possible, and often we carry work farther than is requested when it is evident that the public can be benefited. For example, sometimes individuals draw conclusions from analyses on the basis of findings in other countries. Often this is erroneous, and we endeavor to settle the problem by careful research.

The results of many of the investigations of the Bureau of Science, although available at present, do not become of most value until they are utilized from an industrial, commercial, or educational standpoint. Research work indicates the latent

Interior of a silk house, showing ant-proof racks for the silkworms.



Second story of museum, looking south from the center.



Second story of museum, looking north from the center.

wealth of the nation, and bears the same relation to the commercial world that blocked-out ore does to a developed mine. The intrinsic value and the potential importance of this work are becoming more and more evident as its practical application is demonstrated and appreciated. It is not always easy to anticipate the needs of the country in order to determine which investigations should be carried on first, and certain problems require years for completion, so that much of the work becomes most useful at a later date. It is in the nature of the case that our work must precede the establishment of large industries and consultations with, and advice to, the public and other branches of the Government requiring scientific knowledge of a specialized character. A large amount of the research of this Bureau has been made available in our publications which to date comprise 20,000 printed pages, 2,000 illustrative plates, and nearly 1,000 text figures.

IRON FOUNDRY FOR TSINGTAO.

Information has been published to the effect that it is intended to establish iron-works in the protectorate of Kiaochow with at first two furnaces. Tsingtao has been chosen as the site of the works in preference to the place of production, Chinglingshen, because the customs duties and exportation conditions are more favourable in the protectorate, and because the Imperial Naval Department have met the company very considerably in regard to granting the necessary land and in the taxation question. The cost of the projected works, which will open an entirely new period for Tsingtao, is estimated at about m. 10,000,000. The Shantung Railway Co. will issue new shares to this amount. The settlement of this matter, and the recently concluded railway contract, it is stated, will mean a most favourable solution of the two most important economic questions of the German protectorate, i.e., the iron and the railway questions.

THE DAIREN HARBOUR WORKS

The reclamation of the shore line at the east of the South Manchuria Railway Co. Experimental Bean Mill at Jijiko was to be completed in May. This is for the storing of inflammable goods.

The reclamation of the area of over 100,000 *tsubo* at the east Quay (Dairen Wharves) is going on in full swing and will be finished during the fiscal year of 1915. This large tract of reclaimed land is intended for the storage of goods in custody of the Wharf Office.

The west side of Main Quay, about 2,000 ft. in length, is being reconstructed with the object of getting deeper berths and vertical facing. The original quay wall constructed by the Russians had steps and offsets in its lower part. When the reconstruction work is done, a tract of land ranging from 8 to 9½ ft. in width will be added for cargo-working. More than two-thirds of the work is already completed, and the remainder will be finished by the end of this year.

The new quay, which is to start at 900 feet west of Main Quay and is to run parallel thereto 1,300 feet outward, is to have its foundation on about 8 feet of stone deposit laid as deep as 38 ft. below low tide. For this purpose the bottom of the water area to be used for constructing the new pier must be dredged to that depth. The new pier will be 400 ft. wide. The shore line intervening between the foot of Main Quay and that of the new quay will be reclaimed and made into the central base as the one lying between Main Quay and East Quay. On the completion of the work, the depth of water on the east side of the new quay, 700 ft. long from the pier head, will be 35 ft., and that on the remainder of the east and on the west side as well as at the northern extremity of the quay 30 ft., whilst in the middle of the new basin the water will be 28 ft. deep, all at low tide. This work is to run four years beginning with the present fiscal year. The plan for the current fiscal year is to reclaim about 3,000 *tsubo* of area near the west foot of Main Quay and to lay concrete blocks along the base line between Main and the Third (new) Quays, as well as the length of 400 ft. on the east side of the new quay.

The depositing of stone on the foundation of Northwest Breakwater was nearly completed during last year. Concrete blocks are being put in their places. The westernmost part is already showing above water. There is only a space of about a thousand feet left open to be connected. The work will be finished during 1916. The progress of the work is seriously hampered by the strong north wind, especially during the colder months.

Work in the concrete block yard of the Harbour Works Office was started in the latter part of April. 2,500 concrete blocks and 24,000 cubic yards of concrete have to be made during the present fiscal year. The daily output amounts to 11 or 12 blocks.—*Manchuria Daily News.*

THE PHILIPPINE CARNIVAL

The next Philippine Carnival will be held in Manila from January 30, to February 7, 1915.

As has always been done in the past, a White Carnival City will be built on Wallace Field, a large park in the center of the City overlooking Manila Bay, and within this "City" will be a magnificent open air ball room, capable of holding three thousand dancing couples and six thousand spectators, an auditorium which will hold eight thousand people, a stadium, shows of all kinds, restaurants and all other forms of amusements which go to make up a first class Carnival.

The principal features of the 1915 Carnival will be nine brilliant International fancy dress balls, three magnificent street Carnival parades, and every evening in the auditorium a thrilling open air play in which five hundred people take part. The Association is also bringing out four new acts from Coney Island, the like of which have never been seen in the Far East.

Manila, according to the Government health reports, has a death rate which compares very favourably with any city in the United States, and at the time of year the Carnival is held the climate is delightful, the nights being very cool while the days are bright, clear and not at all warm.

Arrangements for joining the tram lines of the Chinese Tramway Co. and the French Tramway Co. at Shanghai have been completed and through running was to commence on June 13. The manager of the Chinese Tramway Co. has been invited to proceed to Nanking, where he will be asked to consider plans to build a tram line there.

CHINA'S NEW CONSTITUTION

The adepts at Constitution making have been at it again, and have evolved another provisional instrument for the country to struggle under. In the old Constitution the President had little power, and the Legislative organs had much. This time the President has got his own back, and the Legislature has to earn its power, a position which may be more advantageous to China than the imposition upon her, like a deluge, of systems evolved in highly civilized countries, and absolutely unsuited to her present conditions.

In view of the criticism evoked by the promulgation of the new Constitution it is interesting to know the opinions formed on the matter by such a Constitutional expert as Professor F. J. Goodnow, the Legal Adviser of the Chinese Government, and the President-elect of the Johns Hopkins University. Professor Goodnow does not, as it happens, derive inspiration from any personal prejudice in its favor, for though some of his suggestions have been embodied in it he is not its "father." He is able to regard it from a detached point of view, and he has nothing derogatory to say concerning it. In fact, to put his comments in a nutshell, he is disposed to view it as a workable instrument.

"As I look at it," he says, "it is almost a copy of the Japanese Constitution—making allowance, of course, for the fact that there is no Emperor here. I think that is a point in its favor, however, because the Japanese Constitution, adopted as it was in 1889, has certainly shown itself capable of effective application. Under it Japan has been able to protect herself against foreign aggression and has been able to adopt what she regards as the good things of western life. It is, too, it seems to me, now on the point of making a transition into a fairly popular form of Government if I interpret aright what has recently happened in Japan.

"This is said, of course, upon two assumptions, one being that the articles relating to the election of the President which were passed by the late Parliament as part of a permanent Constitution, still remain in force, and the other being that the Li Fa Yuan, for which provision is made in the Constitution now promulgated, is going to be a legislature organised with members elected by the people, thus becoming a representative body.

"It is true that the powers given to the President by this provisional instrument are very comprehensive. He secures a very large power of ordinance and has practically an absolute veto power. He may thus, through the exercise of his absolute veto power, prevent the legislature from passing laws of which he disapproved, and through his ordinance power he may make the law himself provided that his ordinances are not contrary to existing law.

"But, it would seem to be probable that just so soon as a legislature capable of effective action can be organised that it will be impossible for the President to act in matters of legislation contrary to the clearly expressed wishes of the legislature.

"The Constitution gives the legislature very small control over appropriations, providing as it does that the estimates for army appropriations may not be cancelled or altered except with the approval of the President, and that in case the Budget as a whole cannot be established the Budget of the previous year will be used. At the same time it has to be remembered that the Constitution also provides that the levying of new taxes and changes in the tariff rates and the incurring of loans can only be done as a result of a law—that is, can only be done with the consent of the legislature. As the present taxes are insufficient to defray the expenses of the Government, and will be so for a long time to come, and since these expenses are liable to increase rather than decrease, the legislature has very large power over the money which will get into the Treasury and which can be appropriated. So while this Constitution does frankly emphasise the power of the President rather than the power of the legislature it cannot be said that it makes impossible a development of representative or even Republican government.

"It is to be remembered that this Constitution is not intended as a permanent Constitution but on the contrary has been provided in order to enable China to make safely and with the least friction possible the transition from the past autocratic system to some form of representative government. The provisional Constitution provides for the preparation of a permanent Constitution which shall be submitted to a Citizens Conference for final passage.

"If experience shows that wider powers can safely be vested in the legislature than are given to it by the present revised provisional Constitution it will be an easy matter to make provision in the permanent Constitution for such a legislature."

Professor Goodnow takes a fair and comprehensive view of the instrument as a Constitution for the needs of China to-day, and does not, of course, interest himself in any way with the question of Presidential intentions. Many newspapers and publicists profess to believe that President Yuan Shih-kai has no intention of doing other than declare himself Emperor at no distant date, and if the prophets are right in their contentions then no Constitution is worth the paper upon which it is written, for Yuan Shih-kai as Emperor, would be autocratic. On the other hand the President repeatedly proffers reassurances that he has no intention whatever of doing other than promote Repbulicanism, and if his declarations are honest then there is hope that China will have full and complete representative government as soon as her people demonstrate that they are capable of developing it.

TEXT OF THE REVISED CONSTITUTION

Chapter 1. The Nation.

Art. 1.—The Republic of China is composed of the people of China.

Art. 2.—The sovereignty of the Republic of China originates from the whole body of the people.

Art. 3.—The territory of the Republic of China continues the same as that of the former Empire.

Chapter 2. The Citizens.

Art. 4.—Citizens of the Republic of China shall be equal before the law, irrespective of race, rank or religion.

Art. 5.—Citizens shall enjoy the following rights:—

(1) No citizen shall be arrested, imprisoned, tried, or punished, except in accordance with statute.

(2) The habitation of any citizen shall not be forcibly entered into or searched, except in accordance with statute.

(3) Within the limits of the statutes citizens shall have the righ to own and enjoy property and to trade freely.

(4) Within the limits of the statutes citizens shall have the rights of freedom of speech, of writing and publication, and of assembly and association.

(5) Within the limits of the statutes citizens shall have the right of secrecy of correspondence.

(6) Within the limits of the statutes citizens shall have the right of abode and of changing the same.

(7) Within the limits of the statutes citizens shall have the right of religious belief.

Art. 6.—In accordance with the provisions of the statutes citizens shall have the right of petitioning the Legislature.

Art. 7.—In accordance with the provisions of the statutes citizens shall have the right to institute proceedings in the Courts of Law.

Art. 8.—In accordance with the provisions of the statutes citizens shall have the right of petitioning administrative officers and of lodging complaints with the Court of Censors and Administrative Justice.

Art. 9.—In accordance with the provisions of law and ordinance citizens shall have the right to attend the examinations for the appointment of officers and to enter the public service.

Art. 10.—In accordance with the provisions of the statutes citizens shall have the right to elect and to be elected.

Art. 11.—In accordance with the provisions of the statutes citizens are subject to the duty of paying taxes.

Art. 12.—In accordance with the provisions of the statutes citizens are subject to the duty of performing military service.

Art. 13.—The provisions made in this Chapter, that are not in conflict with the law, ordinances and discipline of the Army and Navy, shall be applicable to persons belonging to said services.

Chapter 3. The President.

Art. 14.—The President is the head of the Nation and combines in himself all the powers of government.

Art. 15.—The President shall represent the Republic of China.

Art. 16.—The President shall be responsible to the whole Nation.

Art. 17.—The President shall convoke the Legislature and open, prorogue and close its sessions. The President, with the concurrence of the Council of State, may dissolve the Legislature; in the case of dissolution new members must be elected and the Legislature convoked within six months from the date of dissolution.

Art. 18.—The President may initiate legislation and shall lay the estimates before the Legislature.

Art. 19.—For the promotion of public welfare, for the execution of the statutes, or in pursuance of authority granted by statute, the President may issue or cause to be issued ordinances, but no ordinance shall alter any statute.

Art. 20.—In order to maintain peace and order, or to avert extraordinary calamities, at a time of urgent necessity when the Legislature cannot be convoked, the President, with the concurrence of the Council of State, may issue emergency ordinances having the force of law; but such ordinances shall be submitted to the Legislature for ratification at the beginning of its next session.

Should the said emergency ordinances be rejected by the Legislature, they shall, thereafter, be null and void.

Art. 21.—The President shall prescribe and determine the organisation of all offices and shall issue the regulations fixing the duties of officials.

The President shall appoint and dismiss civil and military officers.

Art. 22.—The President shall declare war and conclude peace.

Art. 23.—The President is the Commander-in-Chief of the Army and Navy, and leads the land and sea forces of the Nation. The President shall determine the organization and the strength of the Army and Navy.

Art. 24.—The President shall receive foreign ambassadors and ministers.

Art. 25.—The President makes treaties, but should articles therein provide for any change of territory, or increase the burdens of the citizens, the concurrence of the Legislature shall be required.

Art. 26.—The President may, in accordance with the provisions of the statute, declare a state of siege.

Art. 27.—The President may confer titles of nobility, rank, orders and other marks of honour.

Art. 28.—The President may grant general amnesty, special pardon, commutation of punishment and restoration of rights. In the case of general amnesty the concurrence of the Legislature shall be required.

Art. 29.—When the President, for any cause, vacates his office or is unable to exercise the powers and functions connected therewith, the Vice-President shall act in his stead.

Chapter 4. Legislature.

Art. 30.—Statutes shall be enacted by the Legislature composed of members elected by the people.

The organization of the Legislature and the method of the election of its members shall be prescribed and determined by the Constitutional Compact Conference.

Art. 31.—The competence of the Legislature shall be as follows:

(1) To discuss and pass bills.

(2) To discuss and pass the estimates.

(3) To discuss and pass or approve measures relating to the assumption of public debts, and to the contracting of other liabilities to the charge of the National Treasury.

(4) To reply to enquiries addressed to it by the President.

(5) To receive petitions from the people.

(6) To initiate legislation.

(7) To submit to the President suggestions and opinions relating to legislation and other matters.

(8) To raise questions in regard to administration over which doubts have arisen and to request the President to reply thereon. But the President may refuse to reply should he deem it necessary for the matter to be kept in secret.

(9) Should the President make an attempt against the state the Legislature may institute against him impeachment proceedings in the Supreme Court of Justice, if approved by a majority of three-fourths or over, of a quorum of four-fifths or over, of the total number of members of the Legislature.

The exercise of the powers mentioned in clauses 1-8 of this article, and articles 20, 25, 28, 55 and 57, shall require the concurrence of a majority of the members present in the Legislature.

Art. 32.—The annual session of the Legislature shall not exceed four months in duration; but may be prolonged should the President consider it necessary. The President may call an extraordinary session during the recess.

Art. 33.—The deliberations of the Legislature shall be public, but the members may sit behind closed doors at the request of the President, or as a result of the decision of a majority of the members present.

Art. 34.—Bills which have passed the Legislature shall be promulgated and enforced by the President.

But if the President shall disapprove a bill duly passed in the Legislature he may return the bill to the Legislature for re-consideration with a statement of the reasons of his disapproval. Even in case that the former decision of the Legislature be adhered to by a majority of two-thirds or over, of the members present, if the President still maintain that the bill would greatly endanger and harm, either the internal administration, of the state, or its foreign relations, or that there are great and important obstacles in the way of its execution, in such a case the President may, with the concurrence of the Council of State, withhold promulgation.

Art. 35.—The Speaker and the Deputy Speaker of the Legislature shall be elected from and among the members by a majority of the votes cast.

Art. 36.—Members of the Legislature shall not be held responsible outside of the House for their speeches, debates, or for votes cast in the House.

Art. 37.—Except when discovered in the commission of a crime, or when involved in crimes connected with internal or external troubles, no members of the Legislature shall be arrested during the session without the permission of the House.

Art. 38.—The Legislature shall prescribe its own rules and procedure.

Chapter 5. The Administration

Art. 39.—The President is the chief of the Administration and shall be assisted by one Secretary of State.

Art. 40.—The affairs of Administration shall be separately conducted by the Departments of Foreign Affairs, Interior, Finance, War, Navy, Justice, Education, Agriculture, and Commerce and of Communications.

Art. 41.—The Heads of the Departments shall manage the Administration of their respective Departments in accordance with laws and ordinances.

Art. 42.—The Secretary of State, the Heads of the Departments, and Special Delegates, representing the President, shall be entitled to sit and speak in the Legislature.

Art. 43.—The Secretary of State and the Heads of the Departments, may be impeached by the Censors and judged by the Court of Administrative Justice, should they violate the law.

Chapter 6. The Courts of Law.

Art. 44.—The Courts of Law shall be composed of the law officers appointed by the President.

The organization of the Court of Law and the qualifications of the law officers shall be determined by statute.

Art. 45.—The Courts of Law, in accordance with the provisions of the statute, shall try and judge, all civil and criminal cases.

But administrative law proceedings and other special law proceedings, shall be tried and judged according to the law governing the same.

Art. 46.—The procedure of impeachment cases in the Supreme Court of Justice, as provided for under clause 9 of article 31, shall be determined separately by statute.

Art. 47.—In the Courts of Law trials shall be conducted and judgment shall be rendered publicly. When, however, it is considered that publicity may be prejudicial to peace and order, or to the maintenance of public morality, secrecy may be observed.

Art. 48.—During his term of office no law officer shall be reduced in salary, nor be transferred to another office, nor shall he be deprived of his office, except as a consequence of punishment according to statute, or of disciplinary measures entailing dismissal.

Chapter 7. The Council of State.

Art. 49.—The Council of State, when consulted by the President, shall deliberate upon matters of state.

The organization of the Council of State shall be determined by the Constitutional Compact Conference.

Chapter 8. Finance.

Art. 50.—The imposition of new taxes and the modification of the rates of the existing taxes shall be made by statute.

The taxes levied at present shall, unless changed by statute, be collected as in the past.

Art. 51.—The annual receipts and expenditures of the state shall be dealt with in accordance with the provisions of the estimates passed by the Legislature.

Art. 52.—In order to meet special requirements there may be included in the estimates appropriations to continue for a certain number of years as a Continuing Expenditure Fund.

Art. 53.—In order to supply deficiency in the estimates, or to meet requirements unprovided for in the same, a Reserve Fund shall be provided for in the estimates.

Art. 54.—Estimates for the objects of expenditure specified below shall not be rejected or reduced, except with the concurrence of the President:—

(1) Those appertaining to the legal obligations of the Government.

(2) Such necessary expenditure as may have arisen as the effects of the statutes.

(3) Expenditures necessary to carry out treaties.

(4) Expenditures necessary for the organization of the Army and Navy.

Art. 55.—In case of international warfare or internal disturbance, or under extraordinary circumstances, when the Legislature cannot be convoked, the President, with the concurrence of the Council of State, may make urgent financial appropriations.

But he shall request the Legislature for ratification at the beginning of its next session.

Art. 56.—If the new estimates have not been acted upon the appropriations of the previous year shall continue in force. The same procedure shall be observed should the adoption of the estimates be delayed after the fiscal year has already begun.

Art. 57.—The final accounts of the receipts and expenditures of the state shall be audited every year by the Board of Audit, and shall be reported by the President to the Legislature for approval.

Art. 58.—The organization of the Board of Audit shall be determined by the Constitutional Compact Conference.

Chapter 9. The Procedure for Drafting the Constitution.

Art. 59.—The Constitution of the Republic of China shall be drafted by a Committee established for this purpose.

Members of this Committee shall be composed of ten persons elected by the Council of State.

Art. 60.—The Draft of the Constitution of the Republic of China shall be examined and passed by the Council of State.

Art. 61.—After the Constitution of the Republic of China has been examined and passed by the Council of State it shall be submitted by the President to the National Convention for final adoption.

The organization of the National Convention shall be convoked and dissolved by the President.

Art. 62.—The Constitution of the Republic of China shall be promulgated by the President.

Chapter 10. Supplementary Articles.

Art. 63.—Laws and ordinances in force before the enforcement of the Constitutional Compact, so far as they do not come into conflict with the same, shall continue to be valid.

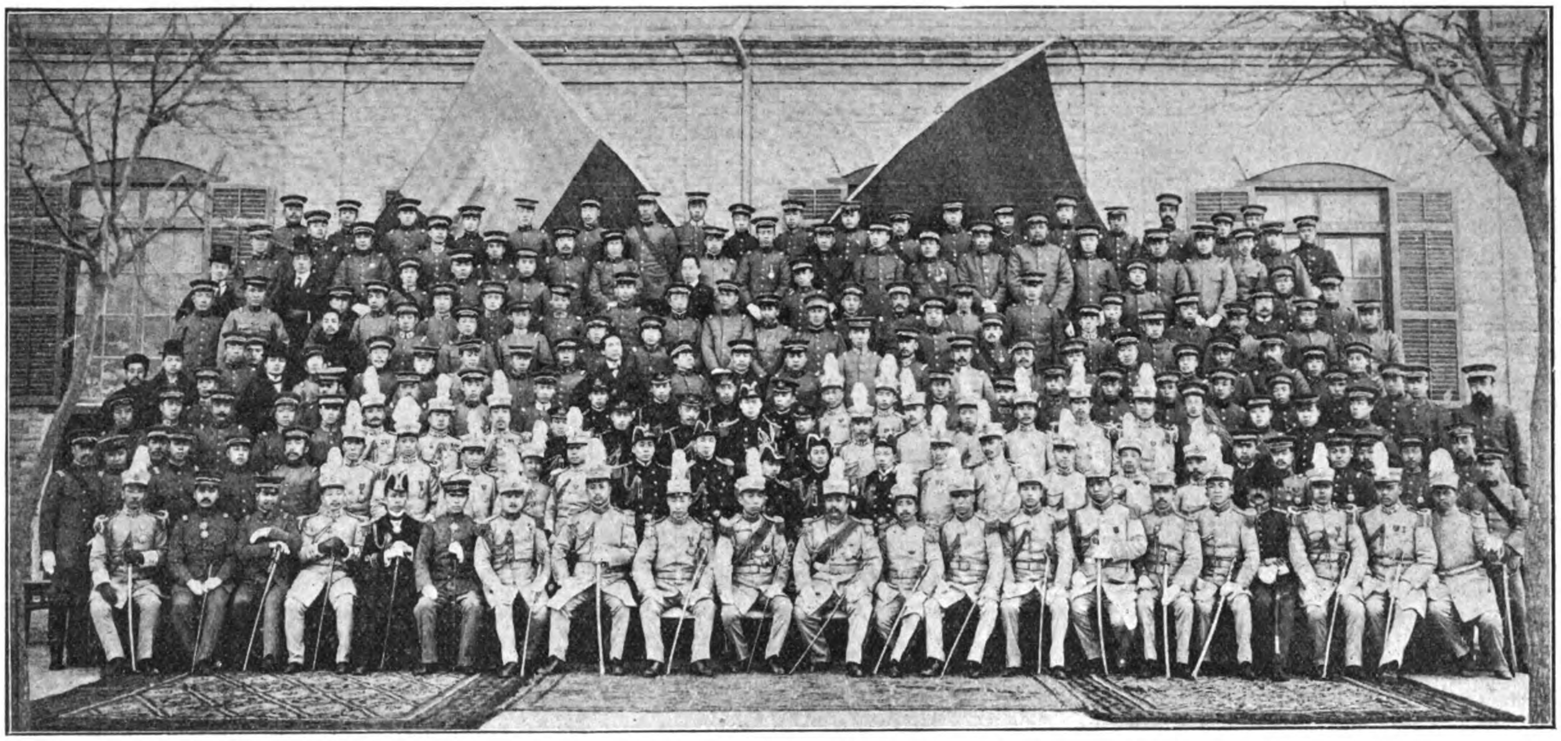
Art. 64.—The Articles proclaimed on the twelfth day of the second month of the first year of the Republic of China, regarding the favourable treatment of the Ta Ching Emperor after his abdication of the Throne, and the special treatment of the Ching Imperial Clan, as well as the special treatment of the Manchus, Mongols, Mohammedans, and Thibetans, shall never be modified.

The statute on the treatment of the Mongols, which is co-related with the foregoing Articles, shall continue to be effective, unless changed by statute.

Art. 65.—On the proposal of a majority of two-thirds or over of the members of the Legislature, or on the proposal of the President, in either case, if approved by a majority of three fourths or over, of a quorum of four-fifths or over, of the total number of members of the Legislature, the President shall convoke the Constitutional Compact Conference to amend the Constitutional Compact.

Art. 66.—Before the Legislature shall have been convoked, its powers and functions shall be assumed and discharged by the Council of State.

Art. 67.—The Constitutional Compact of the Republic of China shall take effect as from the date of promulgation, on which day the Provisional Constitution, proclaimed on the eleventh day of the third month of the first year of the Republic of China, shall become null and void.



The General Staff of the Chinese Army. Vice-President Li Yuan-hung is in the centre of the bottom row.

THE ROBERT DOLLAR LINE

"Harold Dollar" will be the name of the new ocean-going steamer which the Robert Dollar Steamship Company, of San Francisco, has made arrangements to build on the Clyde for service in the lumber carrying trade from ports on the China Coast.

She will be larger than the "Robert Dollar," at present the largest of that fleet, and she will have capacity for handling more than 5,000,000 feet of lumber.

The fleet of the Dollar Line is at present composed of the steamships "Robert Dollar," "Bessie Dollar," "M. S. Dollar," "Stanley Dollar," "Melville Dollar," "Hazel Dollar," "Grace Dollar," and "Mackinaw."

It is the intention of the Dollar Line to use several of these steamers in transporting the greater part of 24,000,000 feet of lumber from Victoria and Vancouver Island, to be used in the construction of the Toronto Harbor Works, and the first of these consignments will go via the Panama Canal immediately after the great waterway is thrown open to ocean traffic. The steamers of the Robert Dollar Line are operated principally in the lumber carrying trade, and the more modern of the fleet are especially equipped for this purpose.

Upon the completion of the "Harold Dollar" she will be the flagship of the fleet. Captain Robert Dollar says the proposed vessel will be built at a cost of about $280,000.

If turned out at San Francisco or any other American yards he declared that the vessel would cost more than $600,000.

The vast difference in favor of the builders in Scotland or England, he holds to be attributable mostly to the higher wages paid mechanics in America.

The "Harold Dollar" will be operated under British registry, with Victoria as her home port, as is the case with other vessels of the fleet.

THE FAR EASTERN REVIEW

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THE HWAI RIVER CONSERVANCY

The news that Lieut. Col. William L. Sibert of the U. S. Army has been appointed to come to China in connection with the Hwai River Conservancy work is extremely important in view of the large sums of money which will be expended if that scheme is proceeded with. Col. Sibert who comes from the Panama Canal with laurels fresh upon him is, next to Col. Goethels, the most eminent engineer in America, and he brings with him a wide knowledge of the highly important science connected with canal and conservancy work. In order that China shall not have imposed upon her a heavy burden for work which may not be profitable to complete, the Red Cross Society has arranged to appropriate the sum of G. $50,000 for the preliminary investigations, and should Col. Sibert be of opinion that it would not be politic to commence reclaiming the flood areas of the Hwai River district the whole of that amount will be borne by the Red Cross Society. On the other hand if Col. Sibert devises a scheme whereby this portion of China may be safeguarded from floods the amount for the preliminary investigation will be borne by the Chinese Government as part of the scheme. Should he report favorably, however, a loan will be floated in America and the well known contracting firm of Messrs. J. G. White & Co. will carry out the scheme devised by Col. Sibert. The Chinese Government are fortunate in having at their disposal so well-known an engineer and so well-known a contracting firm to undertake the onerous task involved in the reclamation of the Hwai River region.

The reputation and experience of Col. Sibert alone stand for superexcellence in engineering. His work on the Panama Canal establishes him as a man of the highest order in the profession. On that great improvement of nature he was in charge of the Atlantic Division, and supervised the construction of the Gatun Locks, the Gatun Dam, the Breakwaters of Colon Harbour and the Excavation of the Channel between the Gatun Locks and the Atlantic Ocean. Col. Sibert is 54 years of age, and graduated as an engineer of the School of Application in 1887; at that time he was assistant engineer on the river work in Kentucky where he remained until 1892, when he became connected with the construction of the ship channel joining the Great Lakes. In 1898 he left that work and became Instructor of Civil Engineering in the Engineering School of Application, subsequently being transferred to the Philippine Islands as Chief Engineer of the 8th Army Corps and Chief Engineer and General Engineer of the Manila and Dagupan Railway. In 1900 he took over charge of the Engineering River and Harbour districts of Louisville and Pittsburg and then became a member of the Isthmian Canal commission, which post has permitted him to do the great work of his career. In China he will be able, perhaps, to add further laurels to his crown.

THE OUTLOOK IN CHINA

Commercial circles in Shanghai still complain of the stagnation of business, but there are numerous indications that all that is now required to initiate an era of prosperity is a better circulation of money. Given adequate banking facilities both the import and export trade may be expected to revive and to increase to a magnitude far beyond anything hitherto experienced. Banking machinery is necessarily fragile, and during the revolution and the subsequent disorder it received many jars which, while not attended by fatal consequences, have necessitated a long period of idleness while the damage was being repaired. Until the financial position of the Central Government gave some indication of improvement it was hardly to be expected that in the provinces there would be a trade revival.

Although it would be incorrect to affirm that the financial position of the Central Government is all that could be desired, it may safely be said that there is a great improvement and that if things continue as they are going there need be no fear of the bankruptcy that last year was thought by many to be impending. It will take careful, cautious and enlightened handling of the situation to place China firmly on her financial feet, but while

the prospect of accomplishing this seemed almost hopeless at one time, it now only depends upon the genuineness of the desire expressed by those in high places to tread the path of prudence. The recuperative power of the country is shown by the Customs returns and by the increased revenue from salt dues and other sources. Honest administration for a few years would place China in a position in which she would be independent of foreign financial assistance except for works of a reproductive character. One of the most gratifying signs that matters have greatly improved is the announcement that, instead of borrowing £25,000,000 for reorganization purposes, it is not likely that China will require more than £7,5000,000 during 1914. This sum is required to pay off the numerous short term loans which from every point of view were better wiped off the slate. Situated as China has been, short term loans cannot be met when they fall due, and this means renewal on onerous terms. With all loans of this description finally disposed of China's credit will be greatly strengthened.

All friends of China will hope she will avoid the danger of wearying of good doing. If, now things are showing marked improvement and the outlook is fairer than it has been at any time during the past two years, she were to recommence the bad old practice of obtaining money for unspecified purposes in return for orders for armaments, or by other means which are opposed to sound finance, she would be in a worse position than ever. In times of stress desperate expedients may appear necessary, though they cannot be justified, and bearing this in mind less condemnation has been visited upon China for the indiscreet Belgian Loan of 1912, the Crisp Loan, the Austrian Armament Loans, etc. than may have been inerited. But the present is not a time of stress and it would be simply deplorable if the tender plant of China's credit after putting out a few tentative sprouts were to be nipped by the frost of freebooting finance. That this will not be so is the belief of those who have trust in the Administration as now constituted.

THE SALT GABELLE.

Sir Richard Dane, Co-Director of the Salt Inspectorate, may well be optimistic about the future, in view of the sum of Tls. 24,000,000 having been obtained from the salt collectorates during the year ended May 20. The service of all the loans secured upon the salt revenue only requires the sum of $16,250,000. When the reorganization scheme now being perfected by the Directors of the Salt Inspectorate is in operation, and conditions in the country regain the normal, it may be expected that a much larger revenue will be available. Some idea of the magnitude of the opportunity that is offered to augment the revenue while actually decreasing the burden upon the consumer, is supplied by the announcement by Sir Richard Dane that the salt merchants procure salt at Tongku at a cost of one cash per catty and retail it in Tientsin at 48 cents and in Peking at 58 cents per catty. This statement, which assuredly would not have been made had not Sir Richard Dane been absolutely sure of his figures, shows that, were there no other considerations to be taken into account, it would be greatly to the public advantage were the Government to eliminate the middleman altogether. That would be probably an innovation of too radical a character, but it is obvious that both Government and people have every justification for a demand to share in the harvest hitherto reaped by the merchants.

Some months ago Sir Richard Dane is said to have declared that he saw no reason to suppose that salt in China would not produce a revenue of six million sterling annually. This would seem to be a very conservative estimate. For several months last year the country was in the throes of rebellion, and when the rebels were suppressed bandits in several of the provinces prevented the restoration of order. Moreover the reorganization of the Salt Gabelle can hardly be said to have been begun, as the regulations were only promulgated in February last. Notwithstanding, the revenue for the past year paid into the Quintuple Banks has exceeded three million sterling. The estimate of $77,000,000 for the financial year 1913-14 may quite possibly be realized.

THE CHEFOO RAILWAY AND BREAKWATER PROJECTS

Within recent months much has been said regarding the proposed railway to connect Chefoo with the Hinterland of Shantung Province, and the breakwater to make Chefoo a harbour capable of mooring seagoing steamers and permitting them to embark and discharge cargo in all kinds of weather. Unfortunately the interests of various parties differ in so far as the creation of a port at Chefoo is concerned, and added to that the apparent disregard by the Chinese of their own possessions has obstructed any final plans being arrived at for the proper developments of the port. In so far as the Railway is concerned the *Chefoo Morning Post* recently set out the vicissitudes of the project, summarising them as follows:—

"1.—As a commercial undertaking; route from Chefoo to Weihsien.

The prospectus stated that, owing to the reluctance on the part of the Gentry to give their active support to an enterprise unfamiliar to the interior it was proposed to construct a line first to Hwanghsien with a capital of two million dollars.

The twenty promoters were each to guarantee the sum of fifty thousand dollars, making a total sum of one million, the remaining million being open to subscription by firms of good standing. Upon the enlargement of the capital the line would be extended to Weihsien as the terminus.

2.—Conversion to Government enterprise.

Certain representations were made to the Board of Commerce from time to time, but owing to depression in trade in the beginning of 1910 the promised financial support could no longer be relied upon, and finally in September of the same year at a meeting of the Chinese Chamber of Commerce, it was agreed to prepare a Memorandum to the Governor of Shantung (Mr. Sun Pao-chi) declaring the inability of the Chefoo merchants to finance the proposed Chefoo railway.

Action in this respect appears to have been delayed till May 1911 when the Chinese Chamber of Commerce made a representation to the Taotai praying, owing to adverse circumstances, for the conversion of the project from a commercial enterprise to a Government undertaking. Further progress was arrested by the Revolution in October 1911 and it was not till September, 1912, that consideration of the subject was revived at a public meeting convened by General Chu Tung-feng, the Administrator, when a provisional committee of Ways and Means was formed composed of twenty-six influential members of the Chinese Mercantile community. It was then advocated that the line be constructed from Chefoo to Hwanghsien, thence to a point between Chang-E and Weihsien, and from there on to Te-chow, a point on the Tientsin-Pukow trunk line, as such a route would not interfere with the German Railway in Shantung and would enable Chefoo to communicate with all parts of China and Europe. A summary of the proceedings was communicated by telegraph to Peking and Tsinanfu. A reply was received from Tsinanfu to the effect that the Tutuh and the Provincial Assembly had endorsed the scheme in a telegram to the Board of Communications.

Later, a telegraphic reply was received from the Board of Communications at Peking pointing out that the proposed line from Chefoo to Te-chow would necessitate the bridging of the Yellow River, thus entailing considerable expense, and the Board therefore advised that some other route be carefully considered and reported upon.

In consequence thereof in the early Spring of 1913, a survey of the Chefoo-Weihsien route was made by Chinese engineers. A plan based thereon was submitted to Peking in due course, which brought forth a response in the form of a despatch dated August 1913 to the Chinese Chamber of Commerce at Chefoo wherein the necessity for the construction of the line was admitted and the Government's obligation in this respect was recognised. Consideration, therefore, as a commercial undertaking need no longer be entertained.

3.—Interdependency of Railway and Breakwater.

Matters then remained in abeyance until the formation of the Chefoo Breakwater Commission which accentuated the

urgent necessity for the railway enterprise and marked the interdependency of the projects. This situation was so fully recognised that it introduced concerted action on the part of the Chinese and foreign mercantile communities finding expression in memorials to Peking in the latter part of April 1914.

Like Tantalus, who stood up to his neck in water, which fled when he tried to drink of it; and over his head hung fruits which the wind wafted away whenever he tried to grasp them, it is now with infinite relief that we greet the news that as a result of the memorials and the patriotic activity of the Kwan Ch'a Shih, Mr. Wu, the engineer deputed by the Chinese Government to make a survey of the route, actually commenced his start from Weihsien on the 1st May and is expected at Chefoo on or about the 1st of June next."

THE BREAKWATER

In the Spring of last year the Chief Harbour Improvement Commission was formed under authority of the Central Government and the Diplomatic Body and the scheme of surtaxes was arranged which came into force on July 1st last. On October 27th Mr. O. C. V. A. van Lidth de Jude, a Dutch engineer, accompanied by an assistant engineer, Mr. B. van Exter, arrived in Chefoo, having been appointed by the Commission to devise a scheme and draw plans for the improvement of the Harbour.

The Engineer had to keep in mind the necessity for the construction of several wharves, capable of accommodating two or three steamers and connected with the shore by rail, and to provide sufficient deep anchorage for the accommodation of large ocean going steamers. The engineers made a very close study of the port and its requirements. They discovered during the boring operations that the bottom of the harbour was covered with a deposit of mud from 9 to 34 feet deep and this discovery has compelled a revision of the original ideas of cost of the work.

Before the engineers were appointed it was estimated that Tls. 1,500,000 would be sufficient to cover the cost of the work but the extra dredging and other costs arrived at by the engineers brought their calculations of cost to a minimum of Tls. 3,000,000—just double the amount originally arrived at. With this amount the engineers estimate that they will be able to devise a port which will give facilities to shipping sufficient to enable it to hold its own with Dairen or Tsingtau. They propose that the improvement work shall consist of a wall on the east running from near the base of Consular Hill due North and overlapping the end of the other wall running from the West Beach in a north-easterly direction. The Breakwater on the east will be the one encountering the force of heavy seas and therefore will, of necessity, have to be built much stronger than the one running north-east.

The fact that the cost has been doubled has caused a certain amount of perturbation among the advocates of the improvement of the Harbour, but the amount is far from excessive if Chefoo—which is the only purely Chinese port on the coast between Shanghai and Tientsin—is to hold its own with those ports which are in foreign hands and which are its chief competitors.

"THE CHINESE REVIEW"

We have received the first number of "THE CHINESE REVIEW," edited by Mr. J. Wong-Quincey, B.A., and Mr. Chih San-chen. The Review is published monthly in London and the desire of the editors is to give expression to Chinese opinion, from the oriental standpoint on questions of moment and interest. That the new publication will supply a real want is the view expressed by Professor H. A. Giles, Viscount Bryce, the Rev. Lord William Gascoyne Cecil, Professor Jeremiah W. Jenks and others, whose letters of commendation and encouragement are published in the first number. An article by Mr. Wong-Quincey on "The Eclipse of Young China" will be read with interest. He adopts the view that foreign countries can best show their sympathy for China in the crisis through which she is passing by letting her alone. Young China, he points out, made the fatal error of miscalculating the strength of the conservative spirit of the Chinese as a people, a mistake it may be mentioned in passing, that was not made by impartial and unprejudiced foreigners who knew their China. To them it was evident from the first that Young China was going too far and too fast. Mr. Wong-Quincey pays a deserved tribute to the minority, which coupled enthusiasm for reform with recognition of the necessity of bearing in mind the character of the people. In his opinion the question of the constitution is not so important as the creation of a new spirit to elevate the whole nation.

Articles are contributed by Mr. H. Wilson Harris, M.A.; Mr. Ku Hung-ming, M.A,, Mrs. Little and others.

JAPAN IN CHINA

The *London and China Express* of May 8, has the following:—

The Peking correspondent of a London morning contemporary remarks that by obtaining the contract for the Nanking-Hunan Railway and its projected branches, the British not only head off the Japanese—who have been endeavouring to secure the right to construct a railway from Fukien to Changsha, with a branch to the Yangtsze—but insure British control of all railways of real importance in the large triangle whose points are marked by Canton, Hankow, and Shanghai. It is understood that the Japanese Government was plainly told that the British Government would not permit Japanese to build a railway beyond Nanchang, from Fukien. Moreover, the Kiangsu section of the Shanghai-Ningpo Railway, which was mortgaged to Japanese during the Revolution, has been redeemed with capital supplied by the British and Chinese Corporation, and it is regarded as merely a matter of time before the rest of this line comes under British control. British financiers, says the correspondent, may be pardoned for viewing Japanese railway schemes in China unsympathetically. In the first place, though this is always difficult to prove, it can scarcely be doubted that Chinese railways constructed under Japanese supervision and management do not afford fair treatment to the freight of other nations. In the second place, it has not been forgotten that with the loans raised in London for the South Manchurian Railway, the Japanese purchased locomotives and rolling stock from the United States. As Japan cannot undertake the construction, upon a large scale, of any railway in China without recourse to the London market, the British Government, adds the correspondent, can reasonably veto any Japanese railway projects which encroach upon the British spheres of influence. It is noteworthy that in foreign circles the frustration of Japanese railway ambitions in the Yangtsze Valley is generally welcomed.

The longest stretch of railway in the world without a curve is said to be in New Zealand, where there is a distance of 136 miles in a perfectly straight line. This fact is remarkable when it is taken into consideration that New Zealand is one of the most difficult countries in the world for railway construction, as it is very mountainous, necessitating sharp curves and very heavy grades.

In recent experiments on the Pennsylvania Railway it is stated that a twelve-car steel train nearly 1000 tons in weight, running 60 miles an hour, was stopped within its own length of about 1000ft. by means of a development of the Westinghouse brake. Besides improvements in the brake mechanism, two shoes are employed for each wheel instead of one, as at present. The new apparatus shortens the time of obtaining the maximum brake capacity from eight seconds in the present system to three and a-half seconds. With electric control, the time is shortened to two and a-quarter seconds. It is also stated that a twelve-car steel train running 80 miles an hour could be stopped within 2000ft.

THE LUNG-TSING-U-HAI RAILWAY

A RUMORED CHANGE OF PLANS

Considerable interest has been taken in the progress being made in connection with the Lung-Tsing-U-Hai Railway, the Agreement for which was signed on September 24, 1912.* By the terms of this Agreement the Compagnie Générale de Chemins de Fer et de Tramways en Chine was to survey and construct a line which would connect Lanchow-fu, the capital of Kansuh, with a seaport to the north of the Yangtsze. It was generally understood that the seaport was to be Haichow. Previous investigations, however, had shown that it would only be possible to transform Haichow into an efficient port by the expenditure of an immense sum of money. The Compagnie Générale appears to have recognised that the project of carrying the line to Haichow had little to commend it and they are reported to have requested that the terminus of the line should be, instead, at Tungchow on the Yangtsze. It was hardly likely, in view of the fact that this deviation would involve severe competition with the southern section of the Tientsin-Pukow line, that the request would be allowed to pass without protest. The British Minister at Peking is said to have protested formally against the proposed deviation, and there the matter has rested.

A correspondent of the *North-China Daily News*, writing from Hsuchowfu on May 22, makes some interesting statements. He says:—

Those who have followed the developments of railway construction for the past few months will be intensely interested in the report, in which considerable confidence can be placed, that the Lung-Hai engineers, who started east from Hsuchowfu some weeks ago following the survey of several years ago, have been recalled. When it is considered that the plans as understood by the public generally were to push the Lung-Hai straight through to the sea at once, the above report will give rise to many questions.

As the only ones who really know are not likely to impart any information on the subject we are left to the use of our eyes, and the reader is also invited to "look see." It is difficult to avoid the conclusion that British and German influence have given the Lung-Hai plans a serous setback, though it is by no means evident it has been accomplished by joining hands. Looking at it from the standpoint of a disinterested bystander, if the Yangtze Valley's being a British sphere of influence means anything at all, Britain cannot possibly acquiesce in the Lung-Hai reaching tidewater anywhere along the River. Hence the terminus of the Lung-Hai has never been definitely announced, it being the common view that if shut off from the Yangtze it would swing to the north and emerge at Haichow. Granted that such had been determined upon, the move of the Germans becomes as plain as day.

It will be recalled that the plans as previonsly announced called for a road from Tsingtao (Kaomi) running due southwest and terminating at Hanchuang, a small hamlet just across the border of Kiangsu and Shantung, putting the whole line in the latter province. The decision announced some time ago in these columns to run the line straight through from Ichowfu to Hsuchowfu, putting about thirty miles in Kiangsu, is evidently the primary cause of the stoppage of the Lung-Hai work to the east. For with a direct line from here to Tsingtao which is already splendidly equipped for handling both exports and imports the line to Haichow is doomed to certain commercial failure. If the interests behind the Lung-Hai are prepared to go down deep into their pockets and draw out the millions of pounds necessary to make Haichow a formidable competitor of either Tsingtao or Shanghai, let them, but there will be a long wait for dividends. Meanwhile the German softly sayeth "Others have laboured, etc."

If the above is a correct guess at the situation, what does it mean for the ambitious Lung-Hai plans?

Anyone deeply interested in the welfare of China will upon mature deliberation very likely come to the conclusion that it is for her best interest that the Lung-Hai should not proceed further eastward than Hsuchowfu. Apart from political possibilities which have been abundantly commented upon elsewhere, the road is an almost incredibly stupid conception, if the Chinese Government has any voice in the railroads whatever. The only competitor it would have is the T. P. R., also a government railway. This brand new road with its spendid construction can handle all the traffic southwards that this generation is likely to see. To build another practically alongside of it is to cripple permanently the revenues of both. The success of the road even from Honanfu to Hsuchowfu, is doubtful as a commercial proposition. If China is able to demand it she should insist that all traffic originating on the Lung-Hai should be carried to its southern destination by the T. P. R.

*The text of this Agreement was published in the FAR EASTERN REVIEW of January, 1913.

OSAKA COTTON TRADE CRISIS

The increase of spindles lately undertaken in Osaka has resulted in an over-production of yarn and this is believed to be the principal cause of the collapse of the yarn market. Yarn merchants and others interested in this business are now going through a painful ordeal, and the consequences are widespread. The coarse yarns of the Kanegafuchi mills have declined to Y100, which is Y3 below the previous lowest rate during the reaction after the activity following the war. The collapse of the coarse yarn market has affected the finer and gassed yarns, and some qualities have suffered a heavy decline of over Y30 on the rate ruling about a month ago. The collapse of the market has struck the yarn merchants a heavy blow, and in Tokyo and Nagoya the failure of one or two is already reported, says the "Japan Chronicle." No failure has so far been reported in Osaka, but disquieting rumours are current, and yarn business is being much interfered with. Business for forward delivery on long terms is entirely suspended, and the greatest precaution is being exercised in business, which is now confined to merchants of the first rank. The difficulty in which the yarn merchants of Osaka find themselves is much accentuated by the precautions taken by banks in dealing with them, and also by the notice given by customers in the interior of the cancellations of orders. They are now placed in the disagreeable position of having to bear the entire loss resulting from the decline in the market. Should a further occur, not a few yarn merchants in Osaka will be forced to go into liquidation.

PETROLEUM IN BURMA

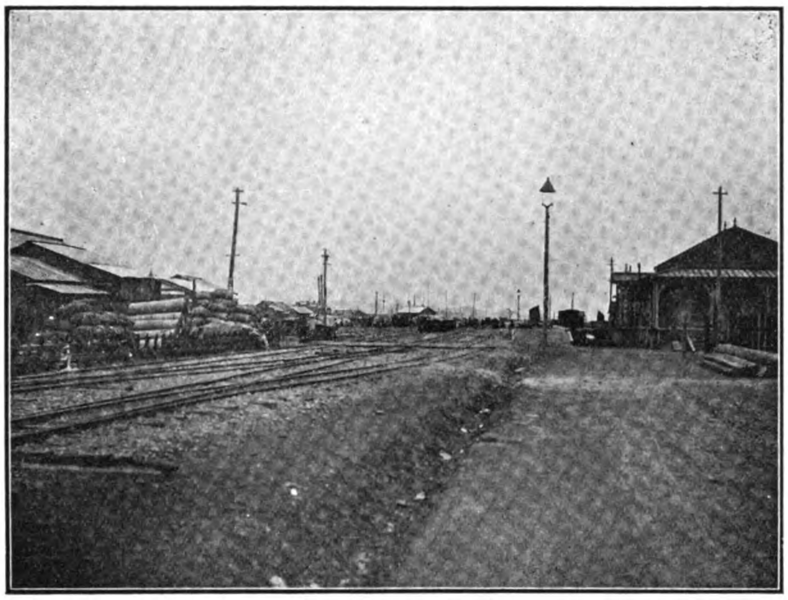
The Indo-Burma Petroleum Co., which has been drilling for petroleum in the upper Chindwin district at Indaw, Kindat Township, has struck oil in three wells. One well is said to have been a "gusher" of 2,000 barrels a day. This is an entirely new field in a wild, sparsely inhabited district. The company is planning to construct a pipe line from Indaw in an easterly direction to the Mu Valley, then turning south along the railway to Myinumu on the Irrawaddy River, not far from Sagaing, opposite Mandalay. The length of the pipe line will be about 170 miles. American pipe will probably be used. Three or four experienced pipe-line men will be needed to act as foremen over gangs of coolies, and one general pipe superintendent will also be wanted. The active development of oil fields in Burma is shown in the fact that the production increased from 116,000,000 gallons in 1904 to 240,500,000 gallons in 1912.

TRADE OF SOUTH MANCHURIAN PORTS

Some interesting facts and figures in regard to the trade of Antung and Newchwang are given in a recently issued number of *Daily Consular and Trade Reports*. Mr. Edwin L. Neville, American Consul at Antung, contributes the report dealing with that port, and therefrom we take the following extracts:—

ANTUNG

The summer of 1913 was an extremely dry one in this district. The extent of the drought is shown by the fact that there was not enough water in the Yalu River to float down the timber that had been cut along the upper river and its tributaries, and the local sawmill was compelled to suspend operations, owing to lack of raw material.



The Railway Station at Antung.

The small rainfall also affected the agricultural community to a very considerable extent. The soya bean crop, one of the mainstays of the district, was very poor. Of the 15 bean mills in Antung 13 were in operation, and many of these only intermittently. There was so much distress in the country that the local Chinese officials were led to take the extreme course of prohibiting the export of grain from certain districts.

Business men and bankers in Antung are authority for the statement that local conditions are the poorest for many years. Building operations are suspended and there are many unoccupied houses and business places. Merchants are complaining that they have much stock on hand which they are unable to dispose of. Unquestionably there is much distress among all classes of the population. Fortunately the winter was unusually mild, or the poorer classes might have been subjected to much real hardship. It is expected that with the return of spring the business situation will become easier. An Italian firm has opened a branch office here in the belief that the present stagnant condition of trade is only temporary.

TREND OF FOREIGN TRADE

Despite apparent adverse local business conditions the trade of the port of Antung showed a considerable relative increase in both imports and exports during 1913. The total net value of merchandise passing through the Chinese Maritime Customs amounted to $10,821,724.

INCREASED TRAFFIC BY RAIL

The revenue of the port increased from $191,916 to $276,115. A noticeable feature of the trade is the rapid increase in rail-borne traffic via the Chosen railways. The value of shipments by rail from July to December, 1912, was $1,019,598, and for the same period in 1913 the value was $3,633,045. Just how much of this increase is due to the reduction of duties on rail-borne goods it is of course difficult to estimate. The figures show, however, that the rate of increase from month to month has not been greater in 1913 than during 1912, and that the traffic in December, 1912, was actually greater than in June, 1913.

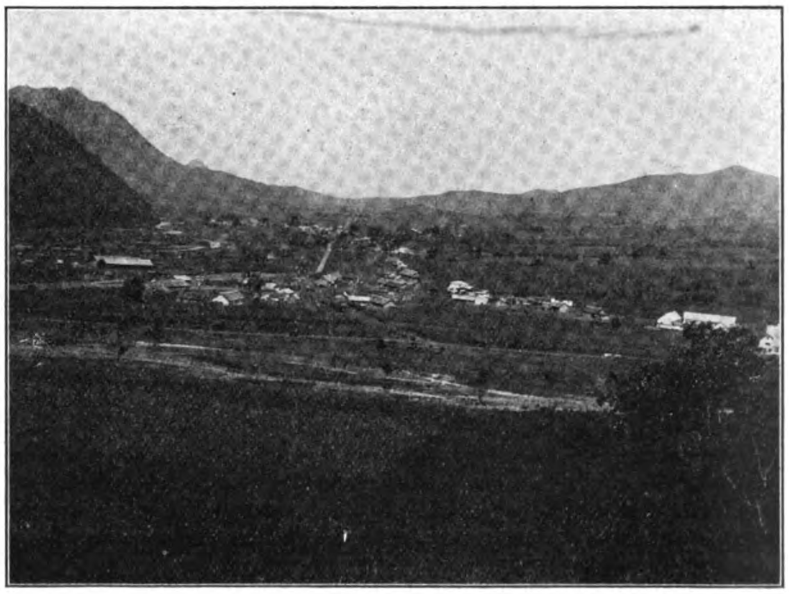
Through traffic arrangements have been completed between the South Manchuria Railway and the Government railways in Japan and Chosen. The South Manchuria Railway has also made its freight tariff on most goods the same between Antung and interior Manchurian points and Dairen and interior Manchurian points.

The statistics here given cover only cargo passing through the Maritime Customs. Figures from the so-called native customs are not obtainable. This is unfortunate, as there is a considerable junk traffic between Antung and points in Chosen and along the coast and the Leased Territory of Kwantung. Efforts are being made to merge the native with the Maritime Customs, but as yet nothing has been definitely settled.

Negotiations are also in progress relating to through traffic in bond by rail from Chosen to the Russian frontier in northern Manchuria. Just what effect such an arrangement would have upon trade in Manchuria is problematic. Still, any increase in railway traffic would call for larger railway equipment.

TRADE WITH THE UNITED STATES

There were no exports invoiced at this consulate to the United States. There were no direct imports from the United States, and the only American product the importation of which increased during the year was kerosene, which was brought in to the extent of 468,982 gallons in 1912, against 673,680 gallons in 1913. Other American imports were negligible.



View of Tsaohckou; a town located midway between Mukden and Antung.

In the future the export of Yalu timber is likely to affect the sales of American soft woods. The export of planks rose from 3,057,146 feet in 1912 to 6,305,744 feet in 1913; this, too, in the face of a scarcity of timber, which was held up by low water. The policy of the timber bureau is to lay in reserve supplies, and it was by drawing on these reserves that a great wood famine was averted in 1913.

TRADE OF TATUNGKOW

The total net value of the trade of Tatungkow in 1913 amounted to only $62,967, against $250,708 in 1912, and the revenue ($1,251) did not pay the expenses of the customs office. The principal imports through the Maritime Customs in 1913 were: Matches, 1,600 gross; American kerosene, 20,960 gallons; Sumatra kerosene, 31,400 gallons; sugar, all kinds, 406 piculs; cigarettes, 17 piculs; paper, 294 piculs; sheetings, 120 pieces. The principal exports were: Bean cake, 13,623 piculs; beans, 9,676 piculs; corn, 188 piculs; wild silk cocoons, 871 piculs.

NEWCHWANG

Vice Consul George F. Bickford of Newchwang reports:—A further decline in the trade of Newchwang took place in 1913, but the decrease, contrary to general expectations, was not so marked as that recorded in 1912. The total value of Newchwang's trade for the two years, stated in United States currency, seems to indicate an increase in 1913 over 1912, but when the difference in the exchange rates of the haikwan tael is taken into consideration it will be seen that, as expressed in taels, the net trade really, did decrease, the figures being 50,385,326 taels for 1912 and 50,064,454 taels for 1913, a loss of 320,872 taels. This decrease is small, however, as compared with that of 7,697,205 taels in 1912. The decrease was confined to the imports, the exports showing some increase.

UNFAVORABLE FACTORS IN TRADE

One of the causes of the decline in trade is the disorganized and unstable currency used in Newchwang and its tributary markets. The value of the transfer tael, an imaginary unit of 53½ taels by which credit transactions are carried on, was as low as $52 small silver coin at the beginning of the year, while it advanced until at the end of the year a quotation of $65 small silver coin was reached. Such an advance, with the many fluctuations during the year, not only had a tendency to make business unsettled and uncertain, but also imposed hardships upon the merchants in making their cash settlements when the proper days arrived.

Another cause of the diminishing trade of Newchwang is the condition of the Liao River, which is constantly becoming more difficult of navigation. The import trade for 1913 shows the effects of the river trouble more than the export trade, but it may be expected that, unless something is done soon in the way of conservation work, in 1914 and in succeeding years still more alarming losses will be experienced in both import and export trade.

Since the partial destruction, in the fall of 1911, of the weir at Shuang Taitzu, which was designed to revert the flow of the Liao into its former channel, no work has been undertaken in the way of restoring and completing it. Toward the end of the year, however, the matter of the Liao River and bar conservancy was again taken up by the Newchwang consular body, and the rules and regulations provisionally signed by that body and the local taotai in July, 1911, which failed of ratification by the higher officials, were, with a few modifications, again proposed. It is hoped by the foreign and Chinese commercial interests in Newchwang that this scheme will receive the Government's approval, and that it will undertake the works on the upper Liao, which includes the Shuang Taitzu weir, coincident with which work it is planned under the agreement that the conservancy work on the lower Liao shall also be undertaken.

Unless the works planned be carried out soon Newchwang will find itself yearly more restricted in its trade with the interior. At present the greater volume of the river is diverted into the Shuang Taitzu, and the Liao is little more than a tidal estuary. For several months past the water supplied by the Japanese waterworks, the pumping station of which is located at Tien Chuang Tai, some 25 miles from the sea, has been brackish, showing how far the tides now run up the river.

COTTON GOODS

There was a general decline from the figures for 1912 in the imports of nearly all kinds of cotton goods. This decrease was not confined to American goods, but was shared by those of both British and Japanese manufacturers. The only American increase for the year worthy of mention was in shirtings, from 145,655 pieces in 1912 to 167,395 pieces in 1913. American sheetings dropped from 282,702 pieces in 1912 to 225,280 pieces in 1913, and drills from 125,347 pieces to 72,670 pieces in the same years, American drills thereby again yielding first place to those of Japanese manufacture.

American cotton goods are recognized by the Chinese as superior to those made in Japan, the sales of which have so greatly increased in the last few years in the Manchurian market. The superiority of American goods lies in the fact that not only are they of finer and more substantial texture, but they are also less heavily sized than the Japanese, which, when washed, lose a greater percentage of their weight than do the American. Japanese goods have supplanted those of American manufacture for a number of reasons contributing mainly to cheapness, of which may be mentioned: (1) the smaller cost of transportation from the mills and incidentally the advantage of direct and frequent shipments; (2) the presence on the ground of Japanese firms with extensive facilities for the distribution of goods, enabling the Chinese dealers to obtain supplies in

The Antung-Mukden Railway: Black Mine Pass.

quantities as small as they desire, while in buying American goods through Shanghai importers it is necessary to contract for considerable quantities at a time—more than most native dealers are able to handle; (3) the difference in time required for filling a contract, this being two or three weeks in the case of Japanese against two or three months required for American.

The general decreases in most lines of cotton goods, not only American but also those from other sources, may be attributed largely to local financial condition. No business was done in cotton goods during 1913 by the British-American Tobacco Co., which in 1911 undertook to act as an agency for American manufacturers in this line, as the enterprise, at least in this district, was abandoned during the preceding year.

FLOUR TRADE

Imports of foreign flour, which is American, decreased from 15,353,883 pounds in 1912 to 9,296,968 pounds in 1913, a loss of 6,056,915 pounds, while Chinese flour shows an advance from 18,535,537 pounds to 24,937,243 pounds in the same period, an increase of 6,401,706 pounds, or slightly more than the decrease in American flour. During the greater part of 1913, as compared with 1912, exchange rates were unfavorable to the purchase of foreign flour. Consequently the American product decreased, while there was a corresponding increase in the importation of flour from the Shanghai mills. A considerable quantity from mills at Tiehling, north of Mukden, is also on the local market.

INCREASED SALES OF AMERICAN KEROSENE

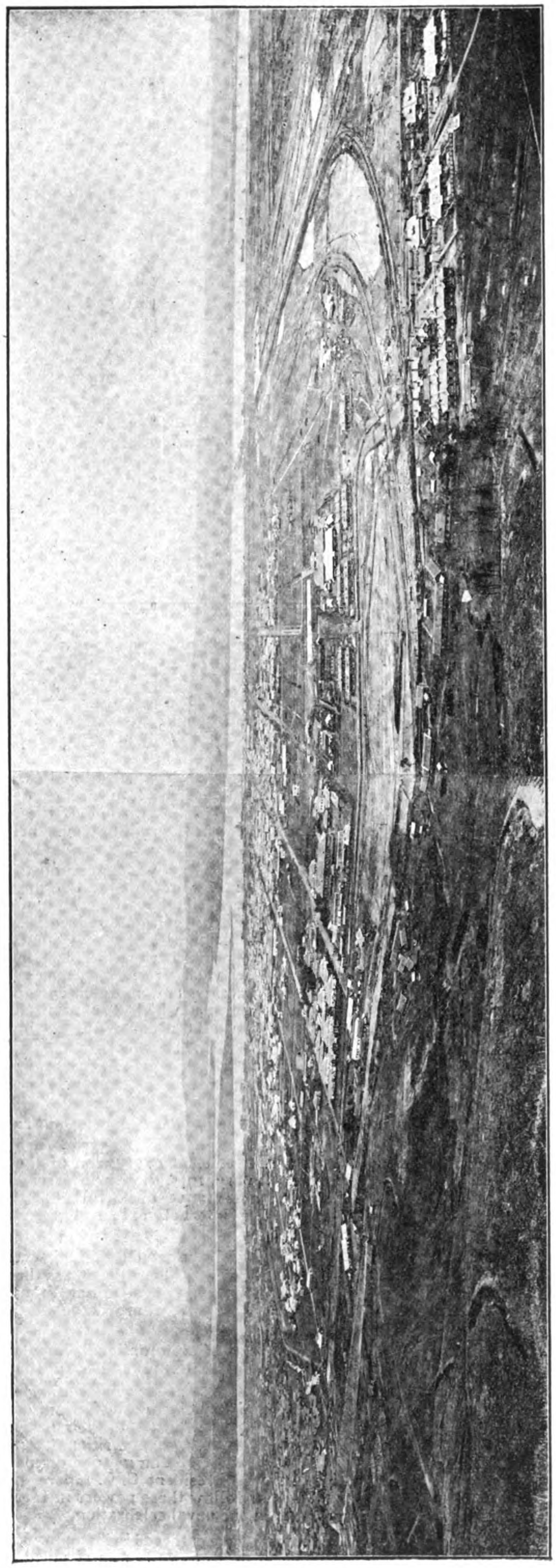
The imports of American kerosene increased from 6,658,225 gallons in 1912 to 8,247,587 gallons in 1913. Russian oil, none of which was imported in the preceding year, appears in the returns for 1913 to the extent of 1,158,748 gallons, but of Sumatra oil only 657,336 gallons were imported, as against 2,660,021 gallons in 1912. There had been no imports of Russian oil since 1910, when 221,110 gallons were brought in. The reason for the large importation of this oil was the shortage of Sumatra oil, which forced the Asiatic Petroleum Co. to turn to Russia for supplies. Some 1,190,000 gallons of American oil were imported in bulk from California by that company during the year. This was the first importation of American oil into Newchwang in bulk, all oil thus far imported by the Standard Oil Co. being tinned.

Deducting the imports of the American product made by the Asiatic Petroleum Co., it will be seen that the Standard Oil Co.'s imports increased in 1913 over those for 1912. A lack of adequate storage facilities was the only thing that prevented greater importations by that company, as there was an increase in demand over the preceding year. This lack of storage facilities is to be remedied by the erection during the current year of a new installation. Congested conditions were heightened moreover, by the difficulties encountered in the navigation of the Liao River. At times, especially in the autumn after what was an unusually dry summer, the water in the river was so shallow that junks were able to carry only quarter cargoes.

SOYA BEAN AND ITS PRODUCTS

The great staple of export from Newchwang is the soya bean and its products, oil and cake. Exports of beans declined from 2,101,447 hundredweight in 1912 to 1,815,411 hundredweight in 1913, but an increase in bean cake and bean oil, from 5,272,656 hundredweight to 5,638,399 hundredweight for the former and from 15,034,824 pounds to 15,062,423 pounds for the latter, took place in the same period.

The statistics show no exports of these products to America or to European ports. Any that found their way to America were probably shipped from Japan. There were increases in the exportation of all these commodities to Japan, with decreases to Chinese ports which, however, still receive most of the oil. The reason that Newchwang contributes nothing in this line, at least direct to European and American trade is that, of the South Manchurian ports, Dairen is the one doing the more distinctively foreign trade, while Newchwang holds the supremacy as regards coastwise commerce, besides enjoying a considerable share in the Japanese trade.



View of Antung with the Yalu River in distance.

The decrease in the shipment of beans was not so marked in 1913 as it was in 1912 from the preceding year, but there is reason to believe that on account of the difficulties experienced in navigating the Liao River during the past year the exportation of all three—beans, oil, and cake—will considerably decrease in 1914, as the stocks that have arrived since the closing of the river and are stored pending the reopening of the port are much smaller than those for the corresponding period in 1912, which enabled a much better showing to be made in 1913 than would have otherwise been the case.

The total bean crop for the Newchwang consular district in 1913 was estimated at nearly 138,000 tons, about the same as the 1912 crop. However, the 1912 yellow bean and upland crops were better than those for 1913, while the lowland crops of green and black beans were larger in 1913 than in 1912. Thus, for this district the two years' crops were approximately the same.

COAL SHIPMENTS INCREASE

The exportation of coal jumped from 193,125 tons in 1912 to 307,461 tons 1913, which shows that Newchwang is rapidly coming to the fore as a coal shipping port. Practically all of this coal is the product of the Fushun and the Penchihu collieries—Fushun, east of Mukden, and Penchihu, to the southeast of the same city. In amount Fushun coal leads that from Penchihu by a considerable margin. The chief ports to which exports went were Shanghai, Canton, Makamatsu, Fusan, Yokohama, and Tientsin.

The returns of the South Manchuria Railway wharf office show that of 601,260 tons of goods, received at Yingkou (Newchwang) during 1913, 384,113 tons, or over 60 per cent, were coal.

EXPORTS TO THE UNITED STATES

The deciared value of the exports to the United States in 1913 was more than double that for the previous year. The increase was mainly in the exports of bristles, while skins of various kinds made up most of the remainder. It is anticipated that during the current year further substantial increases will take place, especially in bristles. Of a total of 123.25 tons shipped from Newchwang during 1913, 59.96 tons, or nearly one-half, were invoiced to the United States. No invoices for shipments to the Philippines, Hawaii, or Porto Rico were certified during the year.

Exports to the United States in 1913 were as follows: Bristles, $86,806; household goods, $450; sesamum seed, $107; dog skins, $10,816; fox skins, $1,151; goat skins, $15,173; marmot skins, $137. In 1912 the value of the exports was: Bristles, $48,370; dog skins, $4,078; goat skins, $3,774.

RAILWAY TRAFFIC

There was an increase in 1913 of nearly 20,000 tons in the amount of goods forwarded from the wharf office of the South Manchuria Railway, Yingkou, while there was an increase of nearly 200,000 tons in the arrivals of goods at the same office. traceable largely to the greatly increased coal business previously mentioned.

PANAMA-PACIFIC INTERNATIONAL EXPOSITION

GREAT NATIONS OF THE WORLD PARTICIPATE IN NAVAL PAGEANT

Early in 1915, the year that will be marked by the formal opening of the great canal which unites the highways of the oceans of the East and the West, the United States will be host to one of the most impressive assemblages of representives of friendly nations ever held in the history of civilization.

At the celebration which is to give educative expression to the legitimate joy of nations at this joining of the waters of the two greatest of the world's oceans, with all its attendant simplification and improvement of their commercial, social, and political relations with each other, there will be gathered exhibits expressive of the highest development in all the arts and industries of the participating nations. The last, the completest, and the most beautiful of the varied results of man's long endeavor to make life less cruel in its processes, and more intense in its compensations, will be gathered in a setting which for natural and architectural beauty has quite probably never been equaled in the history of the world.

And in contrast with these aggregate and inspiring evidences of man's long efforts to create, will be the gathering of the most powerful types of instruments of destruction his ingenuity has been able to devise.

These instruments will be gathered not to destroy; but to put an end to destruction.

The modern battleship is man's most efficient expression of the will to destroy, and during the month of January, 1915, there will assemble at Hampton Roads, Virginia, warships representative of the great maritime nations, which are to participate in the international naval pageant to follow the formal opening of the Panama Canal.

After formal ceremonies of reception at Hampton Roads, the vessels participating will proceed to the waters of the Caribbean Sea, pass through the canal, and thence up the west coast of the continent to San Francisco, where they will enter in impressive formation at some date, yet to be fixed, early in March.

Their advent will be the first event of international importance following the opening of the Panama-Pacific International Exposition on Saturday, February 20, 1915.

Six nations already have formally accepted the invitation of the State Department of the United States to send fleets of their navies to take part in the international cruise. They are: Great Britian, Germany, France, Japan, Argentina, and Portugal. According to Commander David Foote Sellers, U. S. N., naval aid to President C. C. Moore of the exposition, many other nations will soon follow these powers in formally signifying their intention to participate in the naval celebration.

After the fleets of the various powers have gathered in Hampton Roads in January, 1915, the highest officers of the vessels assembled will disembark and proceed to Washington, where they will be formally received by President Wilson, and the principal officials of the United States. After the completion of these ceremonies of reception, the officers will return to their vessels, where President Wilson, from his yacht, the Mayflower, will review the warships of the world as they steam out upon their long cruise.

This cruise, of course, is intended to be the initial voyage of representative ships of all powers taking part through the canal, and in order that the fleet which is to be sent by Japan, may not be compelled to pass through the Panama locks before the ceremonious passage of the pageant, it is expected that this squadron will start some months earlier on an around-the-world cruise through the Suez Canal to Hampton Roads.

While the names of none of the vessels to be sent by the foreign powers have been given out as yet, they will be typical of the latest developments in fighting craft of each nation, and those so equipped will carry their full quota of torpedo and air craft.

On passing through Golden Gate into the Bay of San Francisco, the fleets will be met by fleets of aeroplanes, which will circle in formal figures above the waters of the harbor. The fighting craft of air and water will then proceed in formal review past the bay frontage of the Exposition grounds, making their spectacular progress through one of the most beautiful marine settings to be seen in the world.

It has not yet been determined to whom the honor of the command of this brilliant cruise will fall. Secretary of the Navy Josephus Daniels, in his recommendation to Congress that the ranks of vice-admiral and admiral be created in the United States Navy, in addition to other reasons, recognized the international maritime law whereby the officer of highest rank, irrespective of nationality, takes command of international fleets. Unless these ranks are created, it is believed that some commander of some one of the visiting fleets will be found to rank higher than any attending American officer, and will consequently be given command; as the only officer ranking as Admiral in the United States Navy is George Dewey, whose commission was bestowed by special act of Congress shortly after his victory in Manila Bay during the Spanish-American war, and it is feared that Admiral Dewey's health is such that it would not be desirable for him to undertake the fatigue of commanding on so long a cruise.

The American Ambassador, Thomas Nelson Page, at the Trafalgar Day banquet of the Navy League, held at the Hotel Cecil, London, commented upon this pageant as the "most mighty and impressive naval demonstration in the history of the world."

And, as evidence of the peace spirit in which this friendly assemblage of great machines of war will be held, Ambassador Page was heartily cheered by the British naval men present when, after announcing the British Government's acceptance of the invitation of the United States to participate in this cruise, quoting Lord Nelson, he said: "England's participation will be a happy feature of the celebration of the centenary of peace, and the American admiral leading this fleet can say with Nelson that he had the happiness to command a band of brothers."

Similar expressions of good-will accompanied the acceptance of the United States government's invitation to participate by the governments of Japan, Germany, France, Portugal and Argentina.

Commander Sellers has announced his belief that there will be at least 200 vessels in the pageant, including colliers, other auxiliary craft and submarines.

Although no definite arrangement of any of the more minute details of the cruise has been arranged as yet, undoubtedly target practice contests of international interests will be arranged to be held after the completion of the cruise in the channel at Santa Barbara.

It has been suggested that the Battleship Oregon, of the United States Navy, which made the historical voyage through the Straits of Magellan at the beginning of the war between this nation and Spain in 1898, lead the procession of warships through the canal. However this has not been determined as a certain feature of the event.

The old wooden steamer Hartford, which was the flagship of Admiral Farragut during the civil war, and the Olympia, Admiral Dewey's flagship, during the battle of Manila Bay, probably will be anchored close off the exposition grounds, where they may be visited by sightseers. These two famous ships will be historically typical of the development of the art of war-draft during the last century, and probably will have, as a third contrasting sister exhibit, one of the most recent types of dreadnought from the fleets gathered in the harbor after the spectacular cruise through the canal.

The illuminations of this fleet, as the vessels lie anchored off the exposition grounds, in full view of the two mile long promenade—the beautiful Esplanade—which runs the length of the grounds between the wide turfed gardens of the Marina, the yacht harbor, and the great exhibition palaces, will, taken in conjunction with the illuminations planned for the exposition proper, constitute a night scene indescribable and incomparable.

And when the sightseer reflects that these big, graceful bird-like shapes, glittering like jewel decked swans, are, nevertheless, the inexorable iron monsters which man has built to embody the cruelty of the will which rules by force of destruction, now gathered harmless and shorn of their menace to do honor to the will of man to create—to achieve—and to rule by enlightenment, as exemplified in the triumphal undertaking of the Panama Canal and in its attendant world-wide widening of sympathies, and facilitation of beneficial intercourse between nations, he will gain a new and illuminating vision of the World's Peace.

TRADE PROJECTS IN JAPAN

During the month of April the amount of capital required for various business projects in Japan was 25,220,000 yen according to the Hypothec Bank of Japan returns and 25,581,900 yen according to the Bank of Japan returns, writes The *Japan Advertiser*. Thus the result of the investigations by the two leading institutions of Japan are nearly the same, but the above figures show a great difference compared with 49,000,000 yen which is the amount of capital needed for various business projects during the month of March, though the Tone Water Power Company alone absorbed as much as 16,000,000 yen in that month. Thus deducting this 16,000,000 yen, the total amount required in March was 33,000,000 yen which is 8,000,000 yen more than the amount required in April. Since the beginning of this year, new business projects decreased month by month. The largest new enterprise was the Tokai Water Power Company of 3,000,000 yen, while the largest scheme of extending the scope of business was made by the Nagoya Electric Company requiring 4,000,000 yen for that purpose, and the rest of the business propositions were of minor importance. The aggregate total since January this year was 146,502,000 yen according to the Hypothec Bank of Japan returns and 120,655,000 yen according to the Bank of Japan returns. The result of the investigations by the Hypothec Bank of Japan shows that the capital required for newly establishing companies decreased by 22,835,000 yen, while the capital needed for business extension projects also decreased by 40,225,000 yen as compared with the same period of last year, but the amount of debentures issued increased by 4,985,000 yen.

The Bank of Japan returns for April show:—Banking business, 2,330,000 yen; Electric, 9,050,000 yen; Mining, 600,000 yen; marine products, 500,000 yen; railways and tramways, 2,850,000 yen; industrial, 2,600,000 yen; commercial, and others, 7,650,000 yen; total 25,580,000 yen.

The Hypothec Bank of Japan returns:—Industrial, 5,540,000 yen; electric, 8,845,000 yen; gas business, 60,000 yen; banking, 1,740,000 yen; insurance, 2,300,000 yen; commercial, 1,470,000 yen; railways and tramways, 2,665,000 yen; shipping, 300,000 yen; mining 2,300,000 yen; total 25,220,000 yen.

FOREIGN TRADE OF JAPAN

The foreign trade of Japan during the last 10 days of April was 20,382,000 yen in exports and 19,507,000 yen in imports, showing an excess of exports of 875,000 yen. The total from January was 209,809,000 yen in exports and 254,451,000 yen in imports, indicating an excess of imports of 44,642,000 yen.

During the last 10 days of April there were increased exports of raw silk, cotton yarn, copper, matches and refined sugar, and also increased imports of raw cotton, beans, kerosene, iron material and machinery. An official of the Finance Department, referring to the foreign trade, stated that during the second 10 days of April there was an excess of exports of about 500,000 yen, while the excess of exports during the last 10 days of April was about 900,000 yen. This is a very satisfactory showing. He added that the cause was the low rate of interest in Japan combined with the fall in the prices of commodities which naturally reduced the cost of production of articles for export.

The Yokohama Customs returns show that the trade of Yokohama during the last 10 days of April was 10,252,584 yen in exports and 6,435,720 yen in imports, showing an excess of 3,816,864 yen in exports. The total from January was 98,338,867 yen in exports and 79,595,927 yen in imports, indicating an excess of exports of 18,742,940 yen.

Some time ago it was reported that Negishi and Nakamura of Yokohama being oil producing lots three capitalists of Niigata have applied to the Mines Superintendence Office of Tokyo for permission for prospecting over the lots covering an area of 990,000 tsubo. The Yokohama Municipality raised an objection for the reason of the above districts being residential lots. Now two other capitalists of the same prefecture have made a similar application to the Mines Superintendence Office, this time to prospect Horinouchi, Maita and Okamura of Yokohama over an area of 980,000 tsubo. The above districts mostly consist of farms, and moreover being the sections officially appointed for industrial purposes, the municipality will not raise any objection. It is reported that nobody has ever been observed making any survey of any sort in the localities referred to above, and the whole affair is regarded by some people as a mystery.

The Canada-Japan parcel post treaty will be revised before long, the negotiations between the Japanese and Canadian postal authorities on this subject progressing very satisfactorily. The existing treaty was concluded 23 years ago and it is now regarded as an obsolete instrument, the maximum weight being too small and the postal charges too high. The new treaty is to be mostly on the lines of the latest compacts between Japan and England and other foreign countries. By the new treaty, the maximum weight of 7 lbs. will be changed to 11 lbs. and the postal fees will be greatly reduced and various other facilities introduced. Japanese steamers will be authorised to carry parcels by the new arrangement.

A new Russo-Japanese telegraph convention was signed in Tokyo on May 1, and the telegraph rates were greatly reduced by the new arrangement. The treaty will be made public after obtaining the final approval of the two Governments.

SHANGHAI ELECTRIC CONSTRUCTION CO.

The report of this Company for the year to December 31, 1913, shows a profit of £34,726, which compares with £24,727 for 1912. Including £1,974, the amount brought forward from the preceding year, the total standing to credit of profit and loss account, before making any appropriations, was £36,700. There has been transferred to reserve for renewals account £10,000, and there has been applied in reduction of the preliminary expenses account £3,000. The directors recommend a dividend of 7 per cent. for the year, less income-tax, leaving to be carried forward £1,300. The loss by exchange on subsidiary coinage in 1913 was £25,811, which is over 8 per cent. on the capital of the company. The original equipment, which consisted of 65 motor-cars, will, when the orders in hand are completed, have been increased to 90 motor-cars and 55 trailers. The delay in initiating railless traction in Shanghai has been disappointing. Under the terms of the contract for the supply of the cars a date for delivery was fixed which should have permitted of the service being started during March. None of the seven cars has, however, yet been shipped. The contractors are under penalties. After lengthy negotiations with the Municipal Council, revised rates for electric current purchased by the company from the Council were agreed, with effect from March 5, 1913. The new scale shows a material reduction from the rates previously paid by the company. The benefit of the revision, so far as the past year is concerned, has been incorporated in the accounts now submitted. Through running over the company's system and that of the French company has been in operation throughout the year, and about 30 per cent. of this company's receipts were derived from through cars. It is expected that the through services will be increased shortly.

JAVA SUGAR CROP

The sugar production in the Residency of Soerabaya in the years 1909, 1910, 1911, 1912 and 1913 amounted respectively to 4,030,450, 4,378,667, 5,172,845, 4,524,781 and 4,959,000 piculs. In the Residency of Kediri the production was respectively 2,506,967, 5,693,747, 3,053,046, 3,039,024 and 3,042,900 piculs. The Residency of Pasoeroean, again, produced in those years respectively 2,667,434, 2,950,843, 3,432,707, 3,262,606 and 3,209,000 piculs; the Residency of Madioen 740,846, 705,607, 833,725, 775,711 and 871,000 piculs; and the Residency of Besoeki 946,310, 1,013,890, 1,106,224, 963,697 and 1,062,000 piculs. The total production for 1912 was 22,544,100 piculs and for 1913 23,623,800 piculs.

THE HANOVER LOCOMOTIVE WORKS

SIXTY-EIGHT YEARS OF LOCOMOTIVE BUILDING

On January 30, 1914 the 7000th engine built in the Hanover Locomotive works was handed over for service. This was a ten wheel coupled superheated steam goods locomotive built for the Prussian State Railways, with a six wheeled tender having a water capacity of 3,650 gals. for heavy goods traffic. The boiler of this engine consists of two cylindrical rings of 5'3" diameter, its axis is 8' 10$\frac{3}{8}$" above the rails. The fire box is narrowed in towards the frames and supported between the frame plates, whilst its rear plate is flanged towards the front. The front row of roof stays is movable. The front and side sheets of the fire box are stiffened by hollow rolled copper stay bolts.

The Schmidt superheater which occupies 24 smoke tubes each of 4$\frac{15}{16}$"-5$\frac{3}{16}$" diameter is arranged in four rows. As opposed to earlier practice the smoke tubes have been advanced towards the centre of the tube plate and are surrounded at the sides by a large number of boiler tubes. Experience goes to show that this considerably decreases the strain on the tube plate.

The engine is fitted with piston valves at 8$\frac{5}{8}$" diameter with double steam admission and narrow elastic rings $\frac{1}{4}$" wide. The engine is also fitted with a pressure compensator (cock for compensating the spaces in front of and behind the piston) which can be put in action by hand when the engine is running with the regulator closed and further with air valves of the Knorr type which can be operated with circulation device.

In order to allow the engine easily to negotiate curves the first and fifth coupled axles are given 1$\frac{3}{32}$" play on each side. The flanges of the third or driving axle are turned down $\frac{3}{16}$" more than the others.

The engine is further fitted with the following accessories:

Feed heater worked by exhaust steam of the latest type adopted by the Prussian State Railways, Schmidt & Wagner's valve regulator, Friedmann's lubricating pump with 6 discharge points, Marcotty's smoke combustion device, Kontze's hand sander, steam brake, steam heating and gas lighting.

The injector which is fixed at the right side of the engine feeds direct into the boiler, whilst a steam pump is placed at the left side of the locomotive. The latter makes 40 strokes a minute and supplies 53 gals. per minute, pumping the water from the tender through the feed heater into the boiler.

The feed heater is fastened to the frame plates, it consists in the main of a reservoir into the front and back walls of which 180 brass water tubes are beaded. The front and back plates of the feed heater are closed by means of dished cast steel covers which form with each tube plate a water chamber.

The feed water enters these chambers between the tube plate and the cover and passes through the brass tubes. The space between the sheet iron barrel, the tube plates and the brass tubes is occupied by steam, for which purpose a part of the cylinder exhaust from the two rear exhaust chambers and the exhaust from the feed water and air pumps are utilized. The exhaust steam surrounds the tubes filled with water and thus gives up its heat to the boiler feed water. The heating surface of the feed heater tubes in contact with the steam is 166 sq. ft. The condensed water formed by the exhaust steam is led off into the open air through a pipe with a wide aperture placed in the centre of the engine between the two main frame plates. The Prussian State Railways estimate that a saving in coal consumption to the extent of 10% is obtained by the use of these feed heaters.

The boiler of the engine is suitable for developing permanently 1,000 HP.

The six wheeled tender, the tanks of which have a capacity of 3,650 gals. and the bunkers a capacity of 7 tons is of the latest type of the Prussian State Railways. The diameter of the wheels is 3' 3$\frac{3}{8}$", the rigid wheel base is 14' 5$\frac{1}{4}$". The centre axle has $\frac{5}{16}$" side play on each side. In order to give the engine crew an unimpeded view of the line in front of them when the engine is running backwards, the coal supply is placed in the centre of the tender. The point of attack of the rear draw gear is in front of the last axle, so that swivelling of the draw hook in curves is avoided as much as possible. The lever brake acts on both sides of the 6 wheels.

The *Hanomag Journal*, from which we obtained the foregoing facts, adds:—

We think it will prove interesting on the occasion of the delivery of the 7000th locomotive to cast a retrospective glance on the locomotives built in these works since the year 1846. Although it is only possible to choose the most important from amongst these 7,000 locomotives, we think this will suffice to give the reader an idea of the development of the locomotive types built by the Hanomag; this of course will mean ignoring a number of very interesting designs.

The first locomotive was placed in service on June 15th 1846, after George Egestorff had previously built the tenders for the locomotives purchased in England by the Hanoverian State Railways.

Egestorff's first locomotive was given the name of the then King of Hanover "Ernst August." This engine was of the 2-2-2 type with overhanging fire box. (In those days engines without coupled wheels were generally used.) The boiler consisted of three rings, the second of which was the broadest. The boiler was fitted with 111 brass tubes of 1$\frac{7}{8}$"-1$\frac{15}{16}$" in diameter and 13' 4" in length between tube plates. The boiler and the cylinders were lagged with wood. The frame consisted mainly of two narrow plates stretching from one end of the engine to the other, to which the hornplates were rivetted. The frame plates were bent down in front of the driving axle to make room for the cylinders fixed to the straight side walls of the smoke box. The valve chests were placed in the smoke box with a view to drying the live steam. The slide valves were actuated by inside valve motion of the Howe-Stephenson type with Sharp's links. The purchase price of the engine without tender was £1,690 which is equal to £79.10s. per ton. In 1861-62 this engine was transformed into a six wheels coupled tank locomotive for shunting purposes, the cost being £462.15s. This operation was facilitated by the fact that the tree axle box guides were all equally low on each side of the engine and were connected by a common bridge. As this transformation necessitated the use of smaller driving wheels of a diameter of 3' 4" and as the cylinders were inclined, the rear axle had to be made the driving axle, whilst the eccentrics remained on the centre axle.

The saddle tank of this engine had a capacity of 550 gals. This engine was fitted with a feed heater of the Kirchweger type with a special chimney for the exhaust steam, which system of feed heater was used on all locomotives of the Hanoverian State Railways. After the transformation above referred to the engine weighed in working order about 23 t. 12 cwt. The engine was removed from service in 1872.

Towards the end of the year 1846 a second locomotive of this type was built by George Egestorff which was followed in the next year by a further lot of 5 engines. These latter engines were also transformed later on into six wheels coupled tank-locomotives.

Between the years 1847 and 1852 George Egestorff built 4 similar 2-2-2 locomotives for the Hanoverian State Railways which were, however, fitted with horizontally placed cylinders fastened to the frames.

As early as in 1856 the hundredth locomotive left the establishment. This was a 2-4-0 goods locomotive for the Magdeburg-Leipzig Railway.

As in those days only light goods wagons of 5 tons capacity were used the adhesive weight of four coupled wheels sufficed for hauling goods trains. For this reason similar four wheels coupled locomotives were commonly used for goods traffic on lines with not too heavy gradients. It was not until the sixties of the last century that the above Ra lway began to use six wheels coupled engines.

As in the case of the locomotives above described the latter engines were fitted with a type of boiler with long tubes of 13' 10$\frac{1}{8}$" in length and a deep lying flat grate (distance between bottom edge of fire box and boiler bottom=2' 2"), as used by George Egestorff. This arrangement enabled the hot gases to be utilized to the full extent and a saving of fuel (coke was used in those days) to be achieved. The boiler barrel consisted of three shells made of $\frac{13}{32}$" plates, the midddle shell having a width of 3' 10". The driving and coupling axles of this engine were fitted on each side with a type of bearing springs common to both and loaded by means of levers of a type first employed by A. Borsig, which was very widely used in those days. The engine was fitted with expansion valve motion as commonly used at that time. The 100th locomotive was one of a series of five engines of the same type. The side tanks of these locomotives had a capacity of 640 gals., their weight in working order was 38 t. 8 cwt. The fact that these engines attained the age of 34 years without their boilers having to be renewed is evident proof of their good workmanship.

In October 1862 these works supplied a 2-2-2 express locomotive for the Altona-Kiel Railway. This engine bore the maker's No. 200.

Engines of the same type, which was known as the "Jenny Lind type" and was extensively used in England, were built before that time by George Egestorff for the Duchy of Brunswick. Apart from the fact that these engines were fitted with inside cylinders they are remarkable on account of having double frame plates. Whilst the outer frame plates which stretch from one end of the engine to the other serve to carry the leading and trailing axle boxes, the crank axle (driving axle) was supported by the inner frame plate which only reached to the fire box and was firmly fixed to the latter. This engine was fitted with Kitchweger's feed water heater, a part of the exhaust steam being led to the tender tank where the water was heated to about 104° F. The advantages of heating the feed water by the exhaust steam, which consisted in lessening wear and tear on the boiler and in reducing the fuel consumption, have recently led the Prussian State Railways to fit a large number of their engines with feed heaters worked by the exhaust steam. The 7000th locomotive is also fitted with this arrangement.

Up to the year 1867 George Egestorff had supplied the Altona-Kiel Railway with a further lot of five engines.

In February 1868 Georg Egestorff completed the 300th locomotive. This was a 0-4-2 type of engine for the Royal Eastern Railway, such as was used in those days on lines especially in the East of the monarchy on which traffic was moderately heavy, for hauling goods trains, mixed trains and occasionally passenger trains. This type of engine was fitted with the

following accessories: cast steel disc wheels, without pressed on tyres, supplied by the Bochumer Verein für Bergbau und Gufstahlfabrikation (the counter-weights were also cast on the driving and coupling wheels), a 2 seated safety valve of the Kitson type, Stössger's smoke combustion device and Ricour's counterpressure steam brake. The engine was fitted with Allan valve motion with crossed rods. The bearing springs of the first and second axles were connected by balancers; the trailing axle was fitted with a transverse spring.

During the years 1864 to 1868 the Eastern Railway placed 49 locomotives of this type in service, 17 of which were supplied by George Egestorff. The very respectable number of 129 similar locomotives with the same axle arrangement and Belpaire fire box were built by the Hanomag during the years 1869 to 1874 for the Hanover-Altenbeken Railway and for various other lines.

The economic progress made during the sixties of the last century together with the opening up of numerous new railway lines contributed towards filling the order books of the locomotive department. As early as in February 1870 the 400th locomotive was completed; this was a 2-2-2 passenger engine built to the order of the Roumanian Railways, a type of locomotive which was then commonly used in that country for hauling light trains.

The Hanomag supplied 20 locomotives of this type within a short time to the Roumanian Railways which were established by Dr. Strousberg, and up to a short time ago these engines were still to be seen in use in Roumania, after having been 40 years in service.

The 500th locomotive left the works in November of the same year. This was an express locomotive of the 2-4-0 type with inside cylinders and was supplied to the order of the Brunswick Railways.

A locomotive of this type bore the name "Egestorff." As this was the 100th locomotive which the Hanomag had built for the Brunswick Railways it was decorated with garlands before leaving the works. This engine had a double frame the inner plates of which served for fastening the cylinders and the driving gear parts as well as for supporting the inner bearings of the crank axle, whilst the leading, coupling and driving axles were supported by the outer frame plates. The driving axle had therefore 4 axle boxes.

These locomotives, 34 of which the Hanomag had supplied during the years 1867 to 1874 to the Brunswick Railways were the only 2-4-0 express locomotives with inside cylinders built in Germany.

Whereas these works required a period of more than 24 years for building the first 500 locomotives they only required about one-tenth of that time for the manufacture of the next 500 engines. In the year 1873 the works celebrated the completion of the 1000th engine. This engine together with a 6-wheels coupled goods locomotive for the Alsace-Lorraine Railways were shown at the Universal Exhibition held in that year in Vienna. In recognition of the excellent locomotive work turned out by the firm, the Hanomag obtained the large silver medal, which was the highest award granted at that exhibition.

The clothing of the dome, sand box, safety valve and of the steam cylinders as well as of the wheel cover of a passenger locomotive of the 2-4-0 type, Works No. 1000, was of bronze containing a high percentage of copper and having the appearance of gold. The arms of the city of Hanover were fixed on the sides of the cab. The cab roof was ornamented with a border of the same metal. The Hanomag built 41 such engines between the years 1873 and 1876.

The Hanomag supplied the same Railways with a large number of similar locomotives with drivine wheels of 5′ 0″ in diameter.

On May 6, 1882 the 1500th locomotive left the works. This was a 0-4-2 passenger Tank-Locomotive for the Berlin suburban traffic. It was fitted with a vacuum brake type Hardy in addition to a counterweight brake.

The 2000th locomotive which was completed on September 21, 1888 was built for a narrow gauge railway. It might here be mentioned that the Hanomag made a speciality of the construction of such small engines. The 0-6-2 tank locomotive was supplied to the Bilbao-Durango secondary line in Spain. The line, the gauge of which is 1 metre, has heavy gradients and sharp curves. The rigid wheel base of this locomotive was only 6′ 8″. Its trailing axle of the Adams' type was given side play in the bearings, so that the engine was able to take curves of down to 165 ft. radius. In order to enable the trailing axle better to take the curves, the axle boxes were placed in special outside frames. In the year 1893 the Hanomag built the first two 8-coupled compound goods locomotive for the Prussian State Railways with a leading axle having lateral displacement, a so-called Adams' axle. One of these engines, Works No. 2500, was completed on October 12, 1893. To further facilitate the taking of curves the flanges of the tyres of the two middle axles were turned down to a greater extent than the others. These engines were fitted with a double seated valve regulator as well as a return valve of the von Borries' type. This engine has become one of the standard types of the Prussian State Railways.

The 3000th locomotive left the works on December 11, 1897. This locomotive was a 2-6-0 goods engine of the compound type. The leading axle constructed on the Adams' principle was also given lateral displacement. The engine was fitted with a Dultz' intercepting valve to facilitate starting when the high pressure piston was in an unfavorable position. We might mention that these engines can be made to haul heavy passenger trains up to a speed of 40 miles an hour, provided they are fitted with air brakes.

The 4000th locomotive was given over to the Prussian State Railways on August 1, 1903. This engine is a 4-4-0 four cylinder compound express locomotive with simplified valve motion of the von Borries' type.

The back part of the frame of this engine consists of strong plates whilst the front part is of the bar type firmly bolted to the plates. The employment of bar frames for the front part of the engine gives a sufficiently broad support for the high and low pressure cylinders of each side, which are cast in one piece, and increases the accessibility of the inner driving gear parts. The simultaneous movement of one of the high pressure piston valves and of one of the low pressure slide valves on each side of the engine is assured by a hollow axle which swivels on a firmly fixed pin. In consequence of this arrangement two sets of valve motion suffice, as in the case of two cylinder locomotives, whilst before then four cylinder locomotives of other types invariably required four sets of valve gear. The boiler of this S5 type of engine is similar, as far as its dimensions are concerned, to the S3 type of locomotive with the exception that the boiler plates are thicker to allow of a working pressure of 199 lbs. and that the boiler itself consists of two equally broad rings with butt strap rivetting.

The first engine of this design was shown by the Hanomag at the Paris Exhibition of 1900 where it was awarded the "Grand Prix."

On June 15, 1907 the works celebrated the completion of the 5000th locomotive.

This engine which is of the 4-4-2 compound passenger type was built to the order of the State Railways of the Grand Duchy of Oldenburg. This engine was fitted with the following accessories: Lindner's starting device (conduction of live steam to the low pressure cylinder, the valve motion being in full gear) steam dryer of the von Borries' type built into the receiver (passage of the steam from the high pressure to the low pressure cylinder through 46 heating tubes each of $1^{9}/_{16}$″—$1^{13}/_{16}$″ dia., grouped to form a bundle in the smoke box) and with Staby's smoke combustion device.

The 6000th locomotive was completed in the works of the Hanomag on September 20, 1910.

This engine is fitted with Schmidt's smoke tube superheater and piston valves as well as with a valve regulator of the Schmidt & Wagner type. The engine is further equipped with a steam brake acting on one side of the second and hind axles.

Although the foregoing expose deals principally with locomotives built for German railways (only two of the engines described were furnished for foreign lines), yet the reader will readily notice the gradual progress that has been made during the last 70 years. This result has only been achieved by hard and resolute work. Success, however, attended the Hanomag's efforts and from the day on which the Locomotive Superintendent of the Hanover State Railways gave Egestorff's small establishment—and it was not without hesitation that he did so—the order to build the first locomotive, from that day up to the present time the Hanomag's customers and the firm have worked shoulder to shoulder in the endeavour to attain technical perfection. Thanks to this co-operation the Hanomag has developed into a establishment which during the year 1913 supplied some 450 locomotives worth about £1,373,000 for railways in all parts of the world, not to speak of stationary steam engines, boilers and other specialities of the firm.

NAVIGATION ON THE YALU

With many towns along it, the Yalu has hitherto been greatly lacking in facility of communication both on land and water, says the *Seoul Press*. Small crafts have, it is true, been playing between the towns, but the service has not been regularly undertaken, and communication along the river has hitherto been in a very bad way. This has brought in its train an exorbitant rise in the price of commodities in those towns, owing to scarcity of them in the markets. In the circumstances the necessity of opening a regular service on the Yalu has never been in question.

We now learn that the Government-General has lately ordered the opening of two regular services between New Wiju and Chungkangchin, 220 miles in distance, and between New Wiju and Kangkai. Thirty boats for passengers and 100 lighters for cargo will ply between the three places every day, leaving each port at reasonable intervals, and touching at leading towns along the river, 27 in number. It takes generally two or three days to come down the river but more than two weeks at least to go up.

It is not considered that this condition will be improved by the opening of the regular service just commenced, but it is thought that the number of boats leaving in succession may offset the inconvenience arising from the slow sailing.

WIRELESS STATION FOR HONGKONG

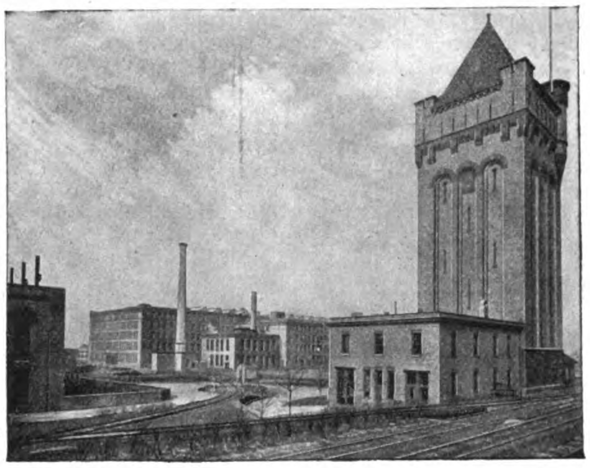
The Hongkong Government has decided to establish a wireless telegraphy station on the island at an estimated cost of $100,000, with a range of 300 miles. The work will be completed by the end of the year. For some years past the commercial community of Hongkong has agitated for a "wireless" station, the absence of which has frequently caused serious difficulty. The *Siberia* incident emphasised the need of a commercial station in the colony, and the determination to establish one may be a direct outcome of that affair.

WONDER-PALACE OF HAWTHORNE

THE ROMANCE OF THE TELEPHONE

As Mr. H. Bedford-Jones says in the *Popular Electricity Magazine*, we are apt to ignore the fact that we are surrounded by contrivances and conveniences that we think little about because custom has staled our appreciation. The object that is seen every day and constantly used is accepted as a matter of course, and we seldom give a thought to the ingenuity of mind that led to its invention, or the magnitude of the processes that are involved in its construction. So is it with the telephone. We use it, occasionally revile the unfortunate operators who make the connections for us, and think no more of the matter. That it is worth thinking about will be seen from the following description by Mr. Bedford-Jones of the works of the Western Electric Company at Hawthorne, Ill., U. S. A.

Twelve thousand men, two and a half million square feet of floor space, an engine room of nearly 10,000 kilowatt power, forests of whirling belts and gyrating spindles, shops covering 200 acres of ground—and all these giving themselves to the production of certain electrical supplies! It symbolizes America, the paradox of history, does this Western Electric Company's plant at Hawthorne. Yesterday a host of infinitesimal energies would create a single tremendous product. To-day a host of tremendous energies create a single infinitesimal product. Yesterday untold thousands of men worked for years on some very great thing such as the Pyramids. To-day a host of giants works on some very little thing such as your desk telephone.



Water Tower.

We seldom pause to realize the greatness of our little things, even though we know that the fragile moth will fret away our heaviest robes, that the delicate rust will consume our thickest armor. Pick up a strand of wire from your telephone; how long would it have required for the deftest workman of a century since to have wrapped this wire? And yet, in this wonder-palace of Hawthorne it is turned out in a few seconds. Machinery? No; something much greater than machinery, as you will see in time.

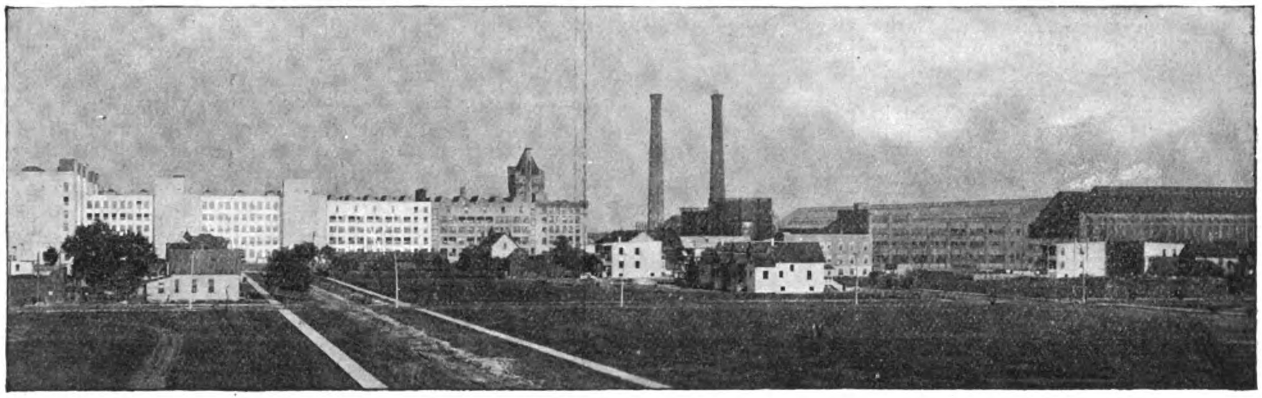
It is extremely imposing on first sight, is this central factory of the Western Electric Company, in which is built all apparatus for the Bell telephone system. The name of the concern is not spread on walls and roof in pompous display. But one's first impression is that of solidarity—the Spirit of the Machine lays hold of one when the gates are passed, and from being a very indefinite and formless shape takes on a gradually increasing growth until at length one is staggered by its complex magnitude.

The gates open upon a broad street, bordered with massive buildings which are apt to increase one's certainty that one of the prime objects of factory buildings is the *enclose things*. With this in mind, you peep inside the door of the warehouse as you pass—and thereafter hold your peace humbly enough.

Now the broad street curves and breaks before you. On the right stretches interminably that gigantic warehouse, more dignified under its proper name of General Merchandise Department. Ahead is a low building in the center of a flower filled park; the hospital, this, with the chimneys of the power plant towering up behind. To the left lies a vista of great buildings; but from this your eye turns to a sheet of spray—the ever flowing feed of the reservoir, and beyond this the water tower.

This square hewed, massive tower is the center of the works—the grim bulldog ever ready to grip the fire demon. Notwithstanding that all the buildings are fireproof, fire walled into sections, and equipped with automatic sprinklers, a trained brigade of firemen is maintained, and around the plant are scattered 45 hydrant houses, which contain all necessary material. At Hawthorne the fire hazard is eliminated, or reduced to a minimum. Even should the two large pumps fail, there is another reservoir and station at the hardwood lumber yard, half a mile away, and the two stations are interconnected.

The hospital, although small, is well able to handle the 60 to 80 cases a day it receives, and it is absolutely complete to the last detail. To one who knows much of hospital work, it is a joy to find such a perfect equipment in a factory; yet it has exactly the same relation to the company's dividends as have the baseball and athletic fields, the tennis courts and restaurants, the band and the library, the men's clubs and the cases of trophies.

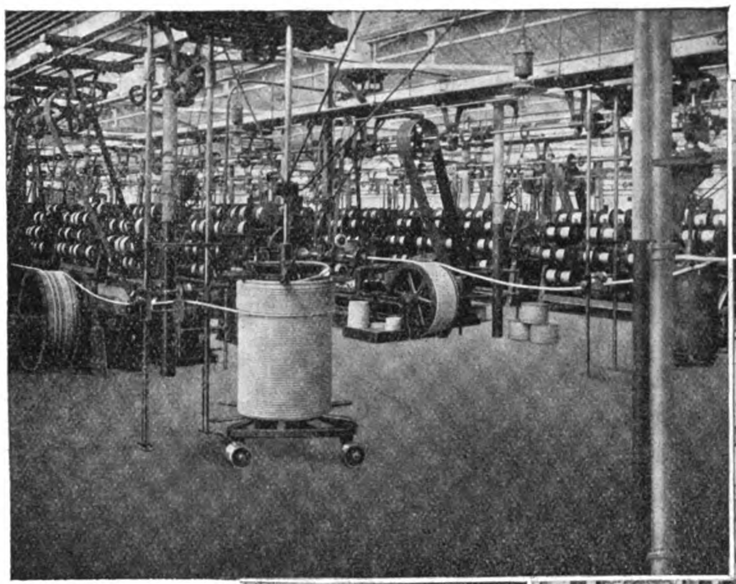


Telephone Apparatus Shops   Work Gas Plants   Central Works Building   Foundry

What an industrial concern cares about is its employees' work. And through welfare lies good work. In the spending of money to-day lies the saving of money to-morrow. No matter how small a hurt, every injured workman goes to the hospital; although the majority of cases are very slight, the hospital is equipped to handle everything. This is more than philanthropy,

it is good business. Athletics, a mammoth restaurant, the largest in Chicago, libraries, clubs, these are not only philanthropies, but methods of business. That this is true shows in the things made and the men who make them. The products of Hawthorne are electric appliances, but its by-products are *men*.

A striking instance of this is shown in the engine room. Here are placed three 2,000 kilowatt steam turbines. When they were to be installed it was decided to place them on stilts instead of on a solid foundation, in order to give increased room beneath.



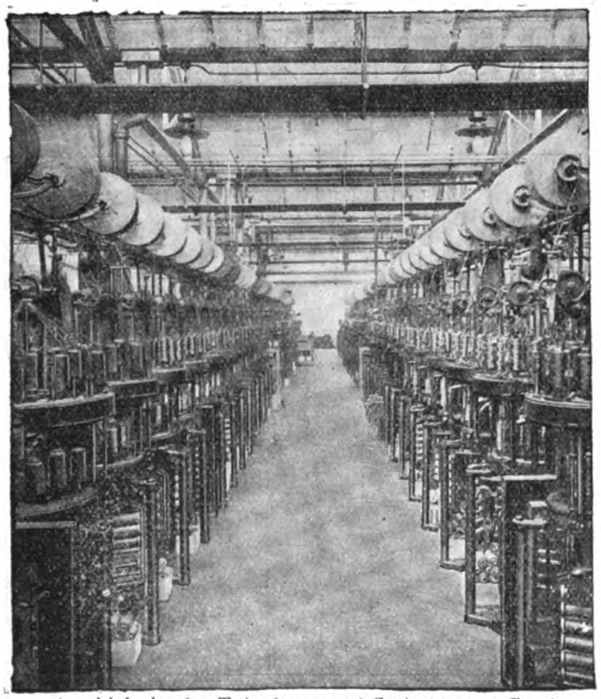
Forming the cable core on the Stranding Machine.

"That is impossible," decided the outside engineers. "The foundation must be solid."

The Hawthorne engineers decided to attempt the impossible To-day you can stand beneath those great turbines, going at top speed, and placing your hand on one of the six stilts supporting each engine, feel hardly a tremor. The stilts are steel and concrete and the men of Hawthorne achieved another triumph.

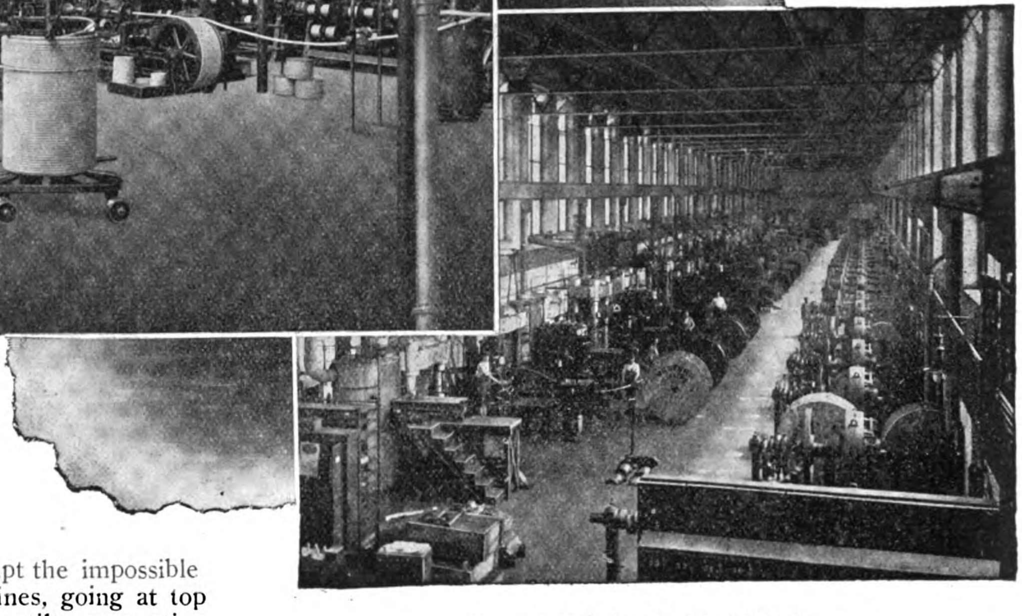
There are two things which stand out pre-eminent above all others in the mind of the visitor and which send him away thoughtful. I visited that gigantic warehouse, through which pass some 13,000 freight cars per year; I saw the piles of crates and boxes, each pile in limits painted on the floor, while electrical trucks loaded or unloaded them. I went through the telephone apparatus shops, with their miles of lathes and punching machinery, through slate grinding and polishing works and lumber mills. I went through the foundry and then through the cable, rubber and insulating shops, from the engine rooms to the offices, and in no part of that whole vast plant did I have to "look out for the dirt." There was none.

Progressive business is taking psychology into consideration more and more every day. It used to be argued that to stop work and pick up filings or shavings was a rank waste of time, or to have anyone else whose special task that should be. But all that is changed now.



An Aisle in the Telephone and Switchboard Cord Braiding Department.

A litter-ed-up floor is bound to have a bad effect upon a workman. If he can simply throw his waste matter on the floor and be rid of it, the principle of carelessness is taught him by his employer. A slovenly workshop means a slovenly workman, and

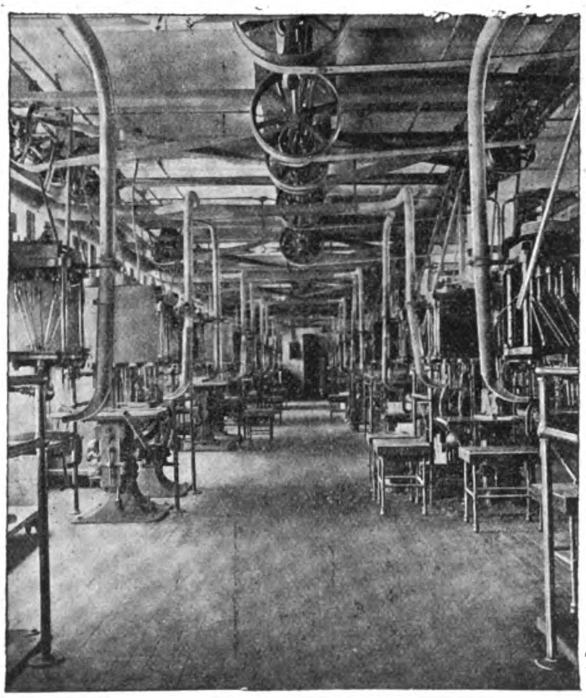


Presses applying the Lead Sheath.

there are a great many big shops and factories which have not discovered that fact. The concentration of energy and the psychology of dirt are about equally important in results. They both cost something to take into consideration, but the dividends are going to show the difference in the end.

Even the foundry at Hawthorne was spick and span, for a foundry. Throughout the shops, dirt was collected, shavings and filings and dust all gathered up and sorted for future use, as soon as made. There was a machine for covering cable with lead, and another for stripping the lead from defective cable—rejected by the testers—at the same rate of speed.

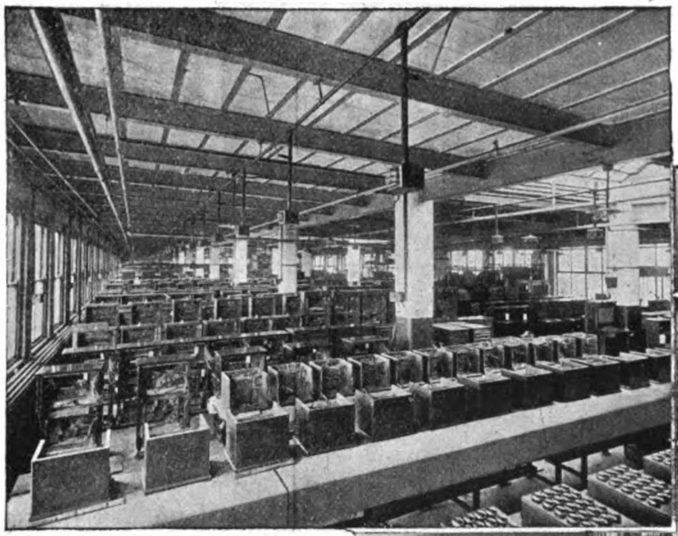
This amazing cleanliness was the first thing that struck me, and the second came about in this wise. I was lunching in the restaurant building. The prices were easily 50 per cent. below those of an ordinary city restaurant,and the food was excellent. About me were college men and foreigners; a Japanese student, in training for special work at a Tokyo factory, a Kansas collegian, a doctor, a



An Aisle in one of the Machine Departments—Telephone Apparatus Shops.

Yale man, all sorts and conditions of men from indentured apprentices up. My guide turned my attention from my surroundings with a jerk.

"Our great principle here," he said, "is economy in handling material. The cable shop is, say, 400 feet across. The crude rubber and wire is unloaded from the cars at one end, goes straight forward, and at the other end is loaded as cable ready for the warehouse. It always goes straight forward, and that's the same with switchboards and all the rest."



Small Switchboard Wiring Department.

"Do you mean to say," I asked, "that the raw material can go across approximately 400 feet and come out finished?"

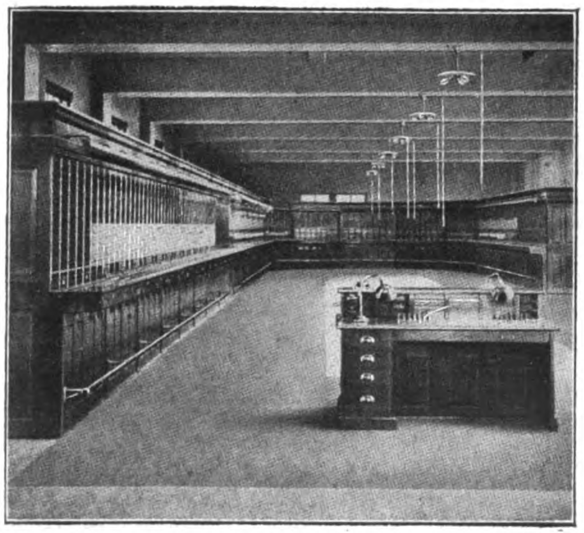
"I can show you a cable made on one floor of the building," he smiled, at which I promptly challenged him to do so, after lunch.

Now this process of cable making is interesting in the extreme, together with most other things in Hawthorne. At the east side of the shops the copper wire comes in. Each separate wire is now wound with thin paper of varying colors, whole rows of machines whirling in unison with a particularly dizzy effect to an outsider. Then, in the next room, two of these wires are twisted together, forming pairs of like color.

From here the paired wires pass to the stranding machines, which twist them into the required cable size. The largest which I saw made contained 600 pairs, of 1,200 separate wires, and as the complete number was obtained each cable received its twisted paper cover. The peculiar twist is given, no doubt, for some technical reason known to the engineers; the color of the "pairs" has a different explanation.

Should a lineman wish to reach a certain point of a laid cable, to repair an injury, he must find which wire to reach. In the outside color wrapping is inserted a key-wire of a different color, and by counting from this on down and around, the lineman can reach the required point and pick it up again a mile farther on if he wishes.

At this stage every single wire in the cable is tested, and it is then baked to remove all incidental dampness. From the ovens it goes directly to the wonderful lead presses, where the lead jacket is applied. The cable is now completed; but for submarine uses it goes through still another process where it receives coating after coating of hemp, wire and a tar preparation, which render it water and injury proof.



A Telephone Central Office Operating Room.

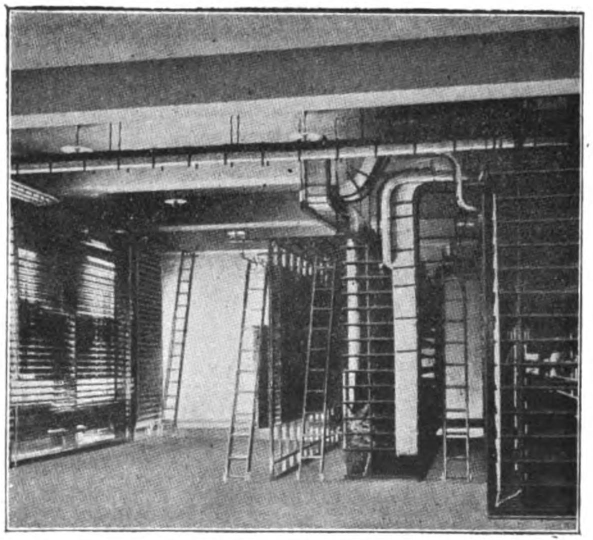
As the cable receives its lead covering, and also as this stage is completed, it rolls upon immense spools. The traveling crane overhead carries these spools for a few feet, and the cable is aboard its car, at the western side of the shops. Thirty miles of cable a day follow this course.

One of the Apparatus Assembly Departments.

In one room of the insulating department there are 600 girls at work wrapping the ends of switchboard cords by hand. This work demands intelligence, and these workers are of a very superior class to the ordinary factory employee. No machine has yet been invented that can do this work with complete satisfaction, but this room turns out 6,000,000 switchboard cords a year.

This remarkable efficiency in handling all material is the second great feature of the Hawthorne plant. I suppose it is the same with the other factories of the Western Electric Company, and there are many others scattered about the world. Most of the European countries where telephone and telegraph lines are owned by the governments, demand that all material used be manufactured in the country itself; so that in each of the European countries the chief factory of the Western Electric has the same scope as this at Hawthorne. And the Hawthorne plant, by the way, is the largest telephone and cable producer in the world to-day.

Again I say that "tremendous trifles" are more impressive than mere big things. Not only this, but American business is largely built upon the skillful handling of complicated detail. And there are only two ways of winning the game of worldly success. You



A Central Office Terminal Room.

must either play it better than the other fellow, or you must use marked cards; and the latter method is rapidly going out of date in this country. This care and attention to the little things, this close watch over the infinitely small no less than over the infinitely big, has revolutionized Hawthorne within the past two years.

Many of the articles of telephone construction and use go through process after process, sometimes as many as 200, and all delicate in the extreme. The great slabs of slate must be bored for the switchboards without the deviation of a millimeter; each piece of wood or metal must be passed down from machine to machine for polishing, boring and fitting; each must pass the inspectors before going to the assembling room, while through it all run the tiny threads of neatness and watchfulness. Each building has its separate clerical force, and each department its foreman; but each department is like every other, in that the visitor has before him straight lines of aisles, spotlessly clean, straight lines of men at work, straight lines of material and machines. There is no lost energy in these shops. There is plenty of room for everyone, but there is none to be wasted.

There is a double training school here. One part is devoted to the training of college men in the ways of the plant, the other is an apprenticeship for boys, who are indentured for a certain length of time. The results of this system are remarkably good. Men are developed for every possible position. Whatever they show most aptitude for is emphasized, until in time they are turned out first class men. And there is always a chance waiting. One young fellow, not yet through his course, happened to think of a simple change in making a certain mold; this change increased the output of a certain product by a third, and that young fellow found a place waiting for him on the next rung up.

Besides the nine central factories in foreign countries, there are many distributing centers. Twenty-six of these are located at strategic points in America alone. The Western Electric shops produce more telephone apparatus than any other concern, having made the 6,000,000 Bell telephones together with all telephone exchange and accessory equipment. The place is in fact a city within a city. Taking the usual average of five to one, there are 50,000 people dependent on this one factory, more than the population of the average American city!

Nor is this splendid industrial "city" a thing of chance, upgrown by the accident of time from small to large. The whole place was built upon a city plan of its own, definite and exact to the last detail, and centered about the frowning water tower.

And so we have seen Hawthorne, ah, but have we even glimpsed it? Have we had more than the tiniest of bird's-eye views? No. For behind the miles of desks and machines, behind this play of giant forces, behind this world-thing are the little heart beats of men pulsating to the ends of the world. And still farther behind these, controlling all, forcing all forward in its indomitable will, is this thing I have called the Spirit of the Machine. Perhaps it would be more rightly called the Spirit of Hawthorne; yet it is found in every such place, and the men who create it are molded by it, for better or for worse, according as they have wrought. Here at Hawthorne is realized the truth of that thunder-text, "Where there is no Vision the people perish,"—for the vision of Hawthorne is the Spirit of the Machine, the power behind the phone, and its people shall not perish.

CONDITIONS IN HUNAN

The report of the Acting British Consul at Changsha on the trade of that district during 1913, which will shortly be issued, contains some interesting information on the affairs of Hunan. It states:—

The prosperity of Hunan, in the absence of any important manufactures, is mainly dependent on its mineral deposits and its agricultural produce. As regards the latter, there is no opening under present conditions for the development of foreign trade. The crops and market produce are grown on primitive lines by small farmers who would look with disfavour on the introduction of foreign machinery and agricultural implements, which, indeed, they would not be in a position to purchase. In the matter of mining enterprises, on the other hand, the Hunanese, though of a very conservative temperament and in their clannishness opposed to admitting foreigners to a share of possible profits, have lately begun to realise that, without the adoption of foreign machinery and methods, they will be unable to do more than merely scratch at the surface of their most valuable deposits, and they fully understand that the acquisition of such machinery and foreign expert assistance is beyond their means, and that, consequently, if their mines are to be properly exploited, the introduction of foreign capital is inevitable. As an instance of this it may be mentioned that the output of the Shui-keu-shan lead and zinc mines has been pledged to a German firm for six years in return for a loan of Tls. 1,000,000 [about £150,000] without interest; a light railway brings the ore down from the mines to Sung-po, on the Siang River, where it is roughly smelted to reduce transport expenses. It is understood that the German firm in question has found this an exceedingly profitable investment, and procedure on similar lines would doubtless prove equally remunerative to United Kingdom firms. Clauses in such loan agreements place the supply of the necessary machinery in the hands of the financing party and provide for expert supervision. For such undertakings local representation in China is essential, and the sanction, of the Central and Provincial Governments must be sought and obtained. Nothing further has been done in the matter of the Changsha waterworks scheme. The subscriptions towards the necessary capital were not forthcoming, and a British company has been approached with regard to a £200,000 loan. It is doubtful, however, whether a sufficiently good security for the loan can be found. A German firm has obtained a contract for installing an up-to-date telephone service in Changsha to replace the former installation, which worked but indifferently. It is proposed to connect Changsha with Siangtan and Wuchang by telephone.

The big increase in the importation of aniline dyes and artificial indigo shows what can be done by means of travelling agents conversant with the Chinese language, the total imports of these goods having been practically quadrupled in two years, althongh political unrest and currency troubles must have hampered considerably the development of the trade in the interior. This method of pushing business in one that has been advocated for many years by H.M. Consuls in China, and has been adopted with conspicuous success by dealers in cigarettes, patent medicine, kerosene oil, sewing machines, sewing cottons, &c.

The revolution seems to have caused little or no change in the style of the dress of the natives of Hunan, except that in the large cities cloth caps and leather foot wear are fairly common: foreign singlets and socks have been in pretty general use for some years, but only the very cheapest quality of all these articles can find a market. Similarly, in the shops in Changsha there is to be seen great assortment of lamps, mirrors, combs, watches, and miscellanous bric-a-brac, all tawdry and tinselly, and all of the most inferior grade. It is not generally realised by United Kingdom manufacturers, at any rate to judge by the inquiries constantly addressed to H.M. Consuls in China, that in China, so far from being able to afford the commonest luxuries, a considerable proportion of the population can barely provide themselves with the necessities of life. Finally, without personal study of local conditions, little hope of ultimate success need be entertained. This fact has been realised by the manufacturers of and dealers in certain commodities, and they have earned good profits in consequence.

SOYA-BEAN MARKET IN MANCHURIA

An optimistic view of the bean market, reports Mr. George C. Hanson, American Vice-Consul at Dairen, is that, owing to the comparatively unfavorable crops of last year, the stocks left inland are smaller than they are given credit for. The farmers have learned from past experience the wisdom of waiting for better prices and are in no hurry to sell. Now that the thaw is setting in the farmers will have to direct all their attention to sowing preparations and the movement of goods will necessarily become slack. The failure of crops in the northeastern district of Japan and Hokkaido, combined with the slump in the rice market, have tended to reduce the demand for bean cake. But with the return of the farming season necessity will cause demands to increase. South China must also be taken into account and a considerable market for bean cake is expected in that direction.

A pessimistic view is that the ruling price, despite its recent decline, is still higher than last year's, the mean quotation of which was $1.90 per 133⅓ pounds. Most dealers seem to believe this to be due to the poor harvest of last year, which, however, is not so bad as supposed. The dealers up country are shrewdly disseminating the impression that the crops were a failure, so that they may profit by a rising market. The crops are estimated to be about 80 per cent. of the previous season, and there are accumulations of stocks at the principal stations along the South Manchuria Railway lines. Sulphate of ammonia and other fertilizers have become popular, and the demand for bean cake correspondingly lessened, especially as the price of rice has declined and necessity compels the farmer to calculate closely when selecting fertilizers. The bean crop in North Manchuria was much better than in South Manchuria. The export from Vladivostok to Europe this year reached a very low point and an outlet is looked for in Japan. It is believed that any attempt to inflate the Dairen market above its normal level will result in failure.

Recently the South Manchuria Railway's central laboratory made analyses of beans from North and South Manchuria. While the South Manchurian bean is smaller than the North Manchurian, the percentage of oil is greater than in the latter. The South Manchurian bean contains 16 to 17 per cent. of oil, as againts the 15 per cent. of oil contained in the North Manchurian bean.

OPERATIONS OF THE CHINESE EASTERN RAILWAY

Prior to the construction of the Chinese Eastern Railway and with the exception of the Ussuri Railway, which runs north and south in the Maritime Province of Russia in Asia and connects Vladivostock and Khabarofsk, the Russian railways did not extend farther east than the Trans-Baikal Railway, writes Mr. Lester Maynard, American Consul at Harbin. Two projects were under consideration for joining these two lines, so as to place the Russian Far East in direct rail communication with the rest of the Russian Empire. One plan was to build a railway following the Amur River and connecting with the Ussuri Railway at Khabarofsk, and the alternate plan was the present Chinese Eastern Railway. At that time the proposed construction of the Amur Railway was abandoned, not alone because it was over 300 miles longer than the direct line through Manchuria and presented serious engineering difficulties, but also because Russia's policy was territorial extension in the Far East.

Chinese Eastern Railway.—A typical station.

BUILT TO ADVANCE RUSSIAN INTERESTS IN MANCHURIA.

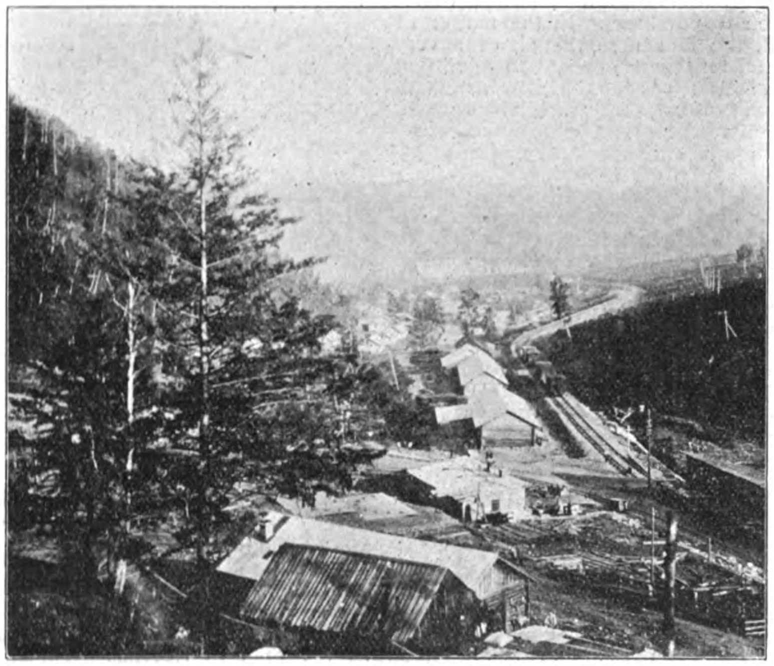
The construction of the Chinese Eastern Railway promised to give Russia great commercial advantages in the trade of Manchuria, Mongolia, and North China, and to make Vladivostock the seaport for North Manchuria. Arrangements were made to hand over the administration of the Ussuri Railway to the Chinese Eastern Railway upon the completion of the latter, and an effort was made to divert commerce through Vladivostock, but after the leasing of the Kwangtung Peninsula by Russia a branch line was built from Harbin, which was the administrative center of the Chinese Eastern Railway, to Port Arthur and Dairen (Dainy), and Russia's attention was then devoted to make the former city an impregnable fortress and the latter a great commercial seaport, even at the expense of Vladivostock, which was to remain principally a fortress.

The present site of Harbin was chosen as the headquarters of the railway on account of its location on the Sungari River, as it was recognized that this, the most important river in North Manchuria, would be the means of delivering the greatest amount of freight to the railway. The railway organized a steamship service on the Sungari, and in connection with the steamers of the Russian Volunteer Fleet, a vast network of Russian commercial influence was spread over all of North China and Manchuria.

GROWTH OF TRAFFIC SINCE RUSSO-JAPANESE WAR.

As a result of the Russo-Japanese War, the Chinese Eastern Railway's operations were confined to that part of Manchuria north of Kwangchengtzu, and attention was again directed toward the building of a great commercial seaport at Vladivostock.

The completion of the Amur Railway will undoubtedly seriously affect the operations of the Chinese Eastern Railway, and it will therefore be interesting to review the operations of the railway since the close of the Russo-Japanese War. Prior to the war the railway has not been placed in thorough running order, and its real influence on the commerce of North Manchuria was not clearly demonstrated. During the war it was given over almost entirely to military use, and therefore the following review starts with the year 1906, although normal facilities were not fully established until 1907.



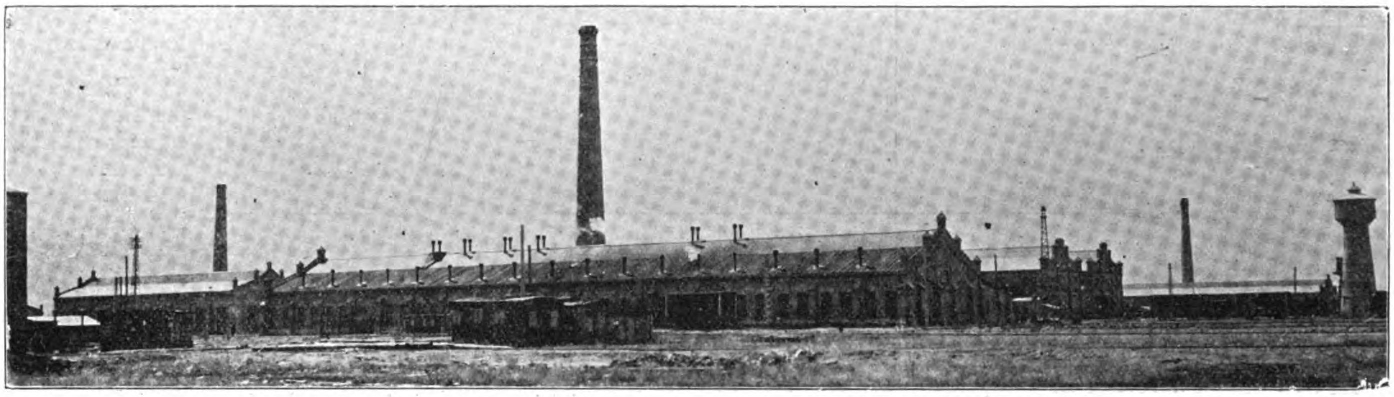
Chinese Eastern Railway.—Through the King-Han mountains.

The movement of slow commercial freight in all directions on the Chinese Eastern Railway for the seven years from 1906 to 1912, inclusive, stated in tons of 2,000 pounds was as follows:—1906, 452,395 tons; 1907, 482,228 tons; 1908, 596,490 tons; 1909, 798,343 tons; 1910, 1,032,103 tons; 1911, 1,336,936 tons; and 1912, 1,218,290 tons.

FREIGHT TRAFFIC ANALYZED.

In the earlier years local freight represented almost half of the total freight hauled, but the rapid increase in the exportation of soya beans resulted in a great increase of export freight to the Ussuri Railway; in other words, to Vladivostock for shipment abroad. In 1908 this traffic almost equaled the amount of local freight, and in 1909 the exports to the Ussuri Railway were more than double the amount of local freight. In 1910 the same conditions prevailed, and in 1911 the amount

increased to almost three times that of the local freight. In 1912 the local and export freight to the Ussuri came nearer together, owing to a heavy gain by the former and a decrease in the latter. The other items of export show a steady increase, the most noteworthy being shipments to the South Manchuria Railway. On the other hand, the amount of local freight shows a very slight increase, except in 1912, and in some years, notably in 1909, fell below the first year.



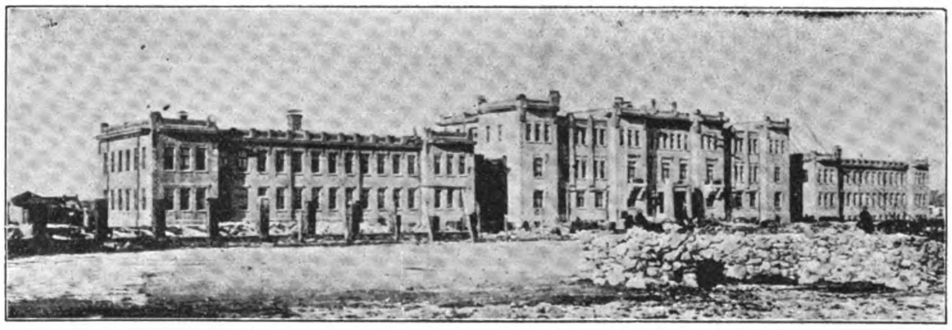
CHINESE EASTERN RAILWAY.—Railway Cars Shops at Harbin.

Import freight from both the Ussuri and Trans-Baikal Railways shows a gradual decrease, and the imports from the South Manchuria Railway a rapid increase up to 1912, indicating that Dairen (Dalny) has been getting the import business of North Manchuria at the expense of Vladivostock. In 1912 the import freight from the Ussuri Railway showed a slight gain, and that from the Trans-Baikal a heavy gain, while the freight from the South Manchuria dropped more than 100,000 tons.

CHINESE EASTERN RAILWAY.—Another typical station.

As in the case of local freight, the transit freight shows but slight change. A general survey of the figures would indicate that although the totals show a gradual and substantial increase in the amount of freight hauled by the railway during the first six years under review, the increases are almost entirely due to the shipments of soya beans, which in 1911 represented about 50 per cent. of the total traffic. In 1912 the exportation of beans was hampered by local disturbances and a weak market.

The figures for 1911 differ slightly from the corresponding figures submitted with the annual report of this consulate for the calendar year 1911. The railway officials state that statistics given at an early date are liable to alteration, and this was the case with the figures supplied in the early part of 1912. The differences, however, are slight, and do not materially change the totals.



The Administration Building at Harbin.

PRINCIPAL ARTICLES CARRIED

The principal articles transported during the last seven years were bags and material for manufacturing, beef, and products of, beef; coal; dry goods, including piece goods; firewood; grain of all kinds, including soya beans; kerosene; lumber and timber, salt; sugar, and tea.

GRAIN AND SOYA BEANS FORM BULK OF FREIGHT

Grain of all kinds and soya beans have been from the beginning of the operation of the Chinese Eastern Railway the principal articles hauled and have shown great increases each year.

Taking the exports separately, it is found that the exports to Vladivostock greatly predominate. Almost the entire amount is intended for export abroad. Owing to the introduction of the customs tariff for eastern Siberia in the early part of 1909, the shipments of flour fell off greatly, whereas wheat imports, which continued to enter duty free, increased in order to supply the mills in the Maritime Province. The shipments of wheat in 1911 were far below normal on account of the shortage of crops.

COAL, FIREWOOD, AND TIMBER MOVEMENTS

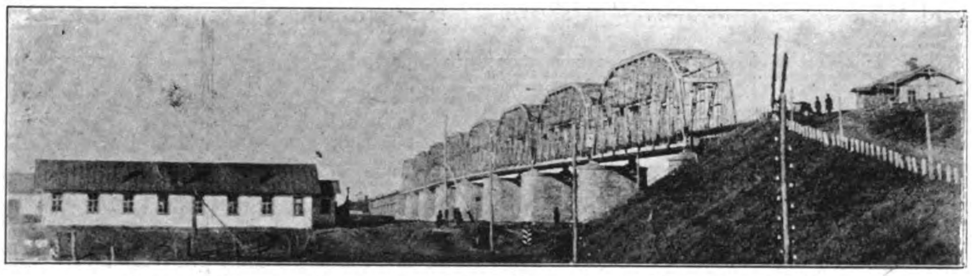
The principal hauling of coal is from the Fushun coal mine of South Manchuria. Formerly this mine was within the area of the Chinese Eastern Railway, and the mine was worked to obtain fuel for the railway, but after the Russo-Japanese War that section of the railway and the coal mine fell into the hands of the Japanese.

The only mine of consequence remaining in the hands of the Chinese Eastern Railway is located at Djalainor to the west of Harbin. This mine is leased by the railway, and produces about 18,000 tons of coal per month, of which 12,000 tons are used by the railway, the remainder being sold to the public.

Practically the only movement of firewood is in local freight. This is due to the fact that after the loss of the Fushun coal mine, the Chinese Eastern Railway was compelled to substitute firewood for coal whenever possible, and as there are numerous forests within the railway area, the cutting of firewood soon developed into an important industry.

The development of the exportation of lumber and timber

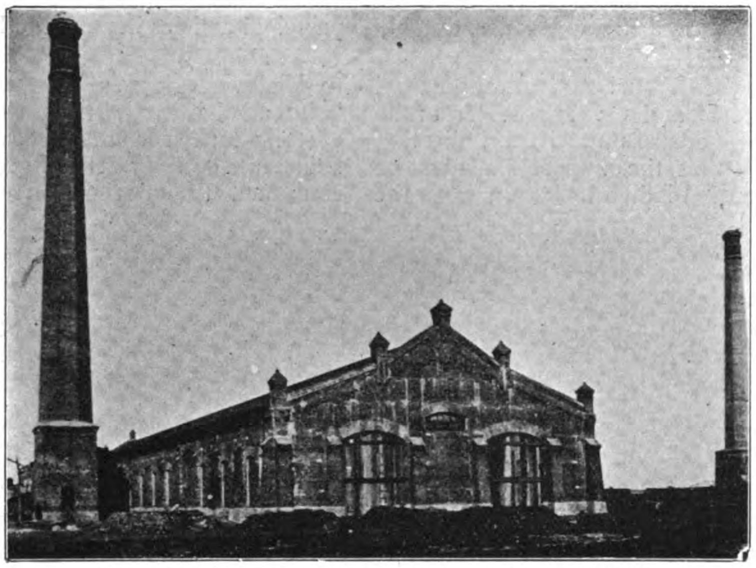
from North Manchuria has not been greatly encouraged, and no serious effort to find markets abroad has been made. Prior to the establishment of customhouses and the erection of sawmills in Eastern Siberia, shipments were made from North Manchuria, but these fell off greatly during 1908. This forced the North Manchurian timber merchants to seek new markets, with the result that shipments to South Manchuria and abroad rapidly developed.



CHINESE EASTERN RAILWAY.—The bridge over the Sungari at Harbin.

DISCRIMINATING RATES FAVOR RUSSIAN KEROSENE

Russian kerosene is shipped by sea to Vladivostock, where it is loaded in tank cars for distribution throughout the Russian Far East and North Manchuria. In order to encourage and assist the sale of Russian kerosene in competition with that from other countries, the Chinese Eastern Railway has arranged its freight tariff in such a way as to discriminate against non-Russian kerosene. They are enabled to do this, as foreign kerosene entering Russian territory must pay heavy import duty, as well as an excise tax, and can not be shipped in transit without paying this double toll. For this reason all non-Russian oil must enter North Manchuria from the south via Kwangchengtzu and pay a much higher rate of freight to points in North Manchuria than Russian oil would pay when shipped in the opposite direction. Russian oil may take advantage of the Vladivostock route and is exempt from import duty. In addition to this discrimination in freight rates, the railway has prepared a special tariff from Russian centers to North Manchuria in an effort to hold this market for Russian oil. The amount of American kerosene imported via Kwangchengtzu suddenly increased and passed the Russian importations in 1910, but showed a decrease to the Russian increase in 1911. In spite of the heavy freight handicap, American oil, by its superiority, finds a ready sale, although at times the prices are higher than Russian oil, and the small shipments in transit from the Ussuri to the South Manchuria Railway indicate that with the advantage of low freight rates the Russian oil is unable to compete with American oil in the south. By arrangement, American kerosene in given the North Manchurian market, and has only Russian oil to compete with.



CHINESE EASTERN RAILWAY.—Machine shops at Harbin.

BEEF SHIPMENTS—PIECE GOODS

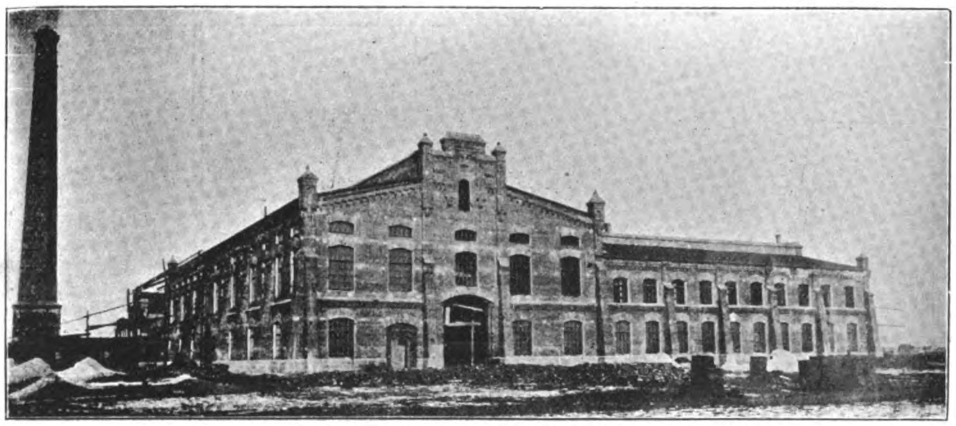
The shipments of beef and beef products have shown but small fluctuation. Mongolia, with its rich pasture lands and large herds supplies Eastern Siberia with beef, a certain quantity of which passes over the Chinese Eastern Railway to the Maritime Province, but the bulk of the shipments are delivered by river in summer and on the hoof in winter. In 1911 and 1912 the figures show increases, which are accounted for by the crop failures of Western Siberia and the necessity of disposing of live stock, which resulted in transit shipments from the Trans-Baikal Railway to the Ussuri Railway.

Piece goods are principally imported into North Manchuria via Kwangchengtzu, and therefore appear in the railway statistics as imports from the South Manchuria Railway. The railway authorities estimate that 75 per cent. of the imports of dry goods, including piece goods, consist of coarse cotton piece goods. These they divide according to nationality as follows: Chinese, 54 per cent.; Japanese, 30 per cent.; American, 16 per cent.

This estimate appears to be greatly exaggerated in favor of Chinese piece goods, which during the years under review were imported in relatively small quantities. Japanese piece goods should take the first place with over 50 per cent. of the total, whereas American piece goods would represent 30 per cent., and Chinese and British would divide the remainder in the order named. Manufactures of cotton, woollen, and silk make up nearly all of such shipments.

TEA SHIPMENTS IMPORTANT—TRAFFIC AND REVENUE.

Tea shipments take fourth place in volume in the traffic of the Chinese Eastern Railway and provide a large part of the railway's revenue, the rate being the highest on the freight schedule. Tea makes up about95 per cent. of the transit freight handled and provides return freight for the cars used to carry grain to Vladivostock, the other westbound traffic taking only a small portion of the empty cars available at that port. Practically all of this traffic will be lost to the Amur Railway when that line is completed. Prior to the Russo-Japanese War tea shipments came via Dalny. During 1904 and 1905 the war caused complete suspension of this trade, which was revived in 1906. About 72 per cent. of the tea imported into Vladivostock comes from China and the remainder from Ceylon, India, and Java. The imports are about equally divided between brick and leaf tea, consisting in 1910 of 30,982 tons of leaf tea and 28,406 tons of brick tea.



CHINESE EASTERN RAILWAY.—Railway shops at Harbin.

The freight and passenger traffic and gross revenue of the Chinese Eastern Railway in 1911 and 1912 were as follows:—1911: Passengers (including military) 1,208,953, freight 3,465,368

tons, revenue $10,016,540; 1912: passengers (including military) 1,639,288, freight 2,699,224 tons, revenue $11,705,235.

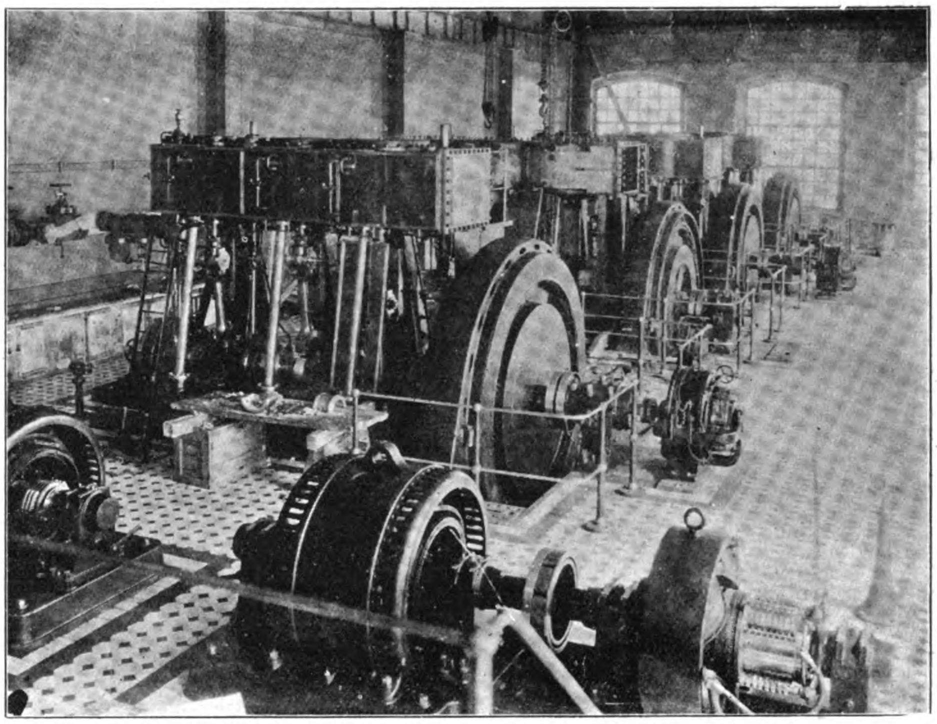
A Street in Harbin.

SALT AND SUGAR FREIGHTS.

Salt, which is an important item in the freight of the Chinese Eastern Railway, is principally imported via Vladivostock. In 1906, the amount handled by the railway was large, as the stocks of salt had become greatly depleted during the Russo-Japanese War, and were replenished during that year. The increases in later years are due to the agreement between the Chinese Eastern Railway and the Heilungchiang and Kirin provincial officials to deliver salt to the Chinese salt monopoly via the port of Vladivostock.

Prior to the building of a sugar factory at Ashiho, North Manchuria depended upon European Russia for sugar, and the principal imports were direct by rail and by sea through Vladivostock. The shipments by sea could be laid down much cheaper, and this brought the rail importations practically to an end in 1909. The consuming power, however, greatly increased, and although a sugar factory was started, it was nevertheless found possible to import Hongkong and Chinese sugar via the South Manchuria Railway, and these importations have gradually increased.

The imports of Russian sugar were 3,187 tons in 1908, 6,146 tons in 1909, 2,396 tons in 1910, and 2,409 tons in 1911. Those of Hongkong sugar totaled 5,240 tons in 1908, 8,461 tons in 1909, 7,274 tons in 1910, and 10,459 tons in 1911.



Electric Light and Power Station at Harbin. The Generating Room.

OIL-TIN FACTORY IN MANCHURIA

An oil-tin factory has been established at Dairen by the Manchuria Manufacturing Co. for manufacturing cans in which to export oils. It is an unincorporated partnership concern, composed of two Americans and one Russian. The present plant employs 1 Japanese as chief engineer and 17 Chinese in the factory and operates by electric motor 8 can-making machines purchased at Mount Vernon, N. Y. Its capacity is 45,000 cans per month, which will be increased to 90,000 cans per month when the size of the plant is doubled, as is planned, in May, 1914.

The product consists of the standard size and shape kerosene can and is being sold at 12½ cents (U. S. currency) each. At present the cost of producing one tin can not be definitely stated, but it is estimated that with the doubled plant running at full capacity without interruption the cost per unit should be 8 per cent. less than the present selling price. The tins are for the most part sold in Dairen.

The raw materials, consisting of tin, tin plate, galvanized wire, lead, and acid, are imported from Europe.

The factory was designed primarily to supply exporters of soyabean oil with a new, clean, and convenient package for such oil. Exporters have heretofore been using second-hand tins, drums, and barrels—the last two not being so popular as the tins—in which most of the oil from Dairen is shipped. Owing to the cheapness of second-hand tins, considerable difficulty is being found in introducing the new container, but the company hopes eventually to be able to replace the old tins by the new. The factors in favor of the latter are: The supply can be made constant, prices can be steadily maintained, large stocks of new tins can always be available for rush orders, leakage is avoided to a greater extent, and the contents of the new are cleaner and in better condition generally than oil in second-hand tins.

As bean oil exports from Dairen are increasing the prospects of success are good.

Typical Street scene in Harbin.

It is reported that the Chinese Government will appoint Commercial Attachés to the Ministries in Berlin, London, Paris, St. Petersburg, Washington and Tokyo.

The *Shuntien Shih Pao*, a Peking papers reports that American capitalists have proposed, that the Government should establish ironworks at Hanyang for the purpose of exporting pigiron to America.

FAR EASTERN RAILWAYS

CHINA

Shantung Railway.—A Berlin telegram dated May 18 states that the Shantung Railway receipts in 1913 amounted to Mks. 4.130,000 and the expenses to Mks. 1,190,000, as compared with Mks. 4,130,000 and Mks. 1,170,000 respectively in 1912. The car agreement with the Tientsin-Pukow Railway has been successful and furthered the production of coal, which amounted to 612,201 tons in 1913 against 413,033 in 1912. The prospects of the sale of coal are as favourable as they were last year.

Peking-Hankow Line.—A German telegram says:—The main points of the draft of the second loan which the Ministry of Communication is said to have closed for the Peking-Hankow Railway with American, English and other European capitalists, as follows: The amount of the loan is twenty million dollars in bonds of one hundred dollars each. Interest is paid at seven per cent. It runs for twenty years. Amortization will be commenced from the eleventh year. The income of the railway is pledged as security for the loan.

Hangchow-Ningpo Railway.—The Chinese newspapers report that the Ministry of Communications has decided to erect a bridge across the West Lake at Hangchow in order to join the lines of the Hangchow and Ningpo railways. According to an estimate the cost will be $500,000 and the bridge will be completed in eight months. The shareholders of the Chekiang Railway Company will hold another meeting on June 5 to discuss the matter of redeeming the property of the company by the Central Government. The Ministry of Communications has already appointed a deputy to manage the business of the company. The contract for the construction of the iron bridge will be signed shortly.

Yuet-Han Railway.—At a recent meeting of the Shareholders of the Yuet-Han Railway (the Kwangtung section of the Canton-Hankow Railway) the election was held to select a Managing Director of the line. Mr. Liang Ching-kwai secured the position with 60,000 votes, Mr, Jeme Tien-yu having the second highest number. Mr. Liang Ching-kwai therefore becomes the new Managing Director.

Shanghai Nanking-Railway—The following figures of traffic returns (approximately) for the week ended April 18 are issued by the Shanghai-Nanking Railway:—

Year.	Passengers.	Goods & Sundries.	Total for the week.
	$	$	$
1914....	54,387	12,889	67,276
1913....	52,005	11,977	63,982
Increase.	2,382	912	3,294
Decrease	—	—	—

For forty-two weeks.

Year.	Passengers.	Goods & Sundries	Total
	$	$	$
1914....	2,025,220	426,009	2,451,229
1913....	1,809,648	359,025	2,204,673
Increase.	215,572	30,984	246,556
Decrease	—	—	—

Week ended April 25.

Year.	Passengers.	Goods & Sundries.	Total for the week.
	$	$	$
1914....	49,633	12,029	61,662
1913....	43,716	10,119	53,835
Increase.	5,917	1,910	7,827
Decrease	—	—	—

For forty-three weeks.

Year.	Passengers.	Goods & Sundries.	Total.
	$	$	$
1914....	2,074,853	438,038	2,512,891
1913....	1,853,364	405,144	2,258,508
Increase	221,489	32,894	254,383
Decrease	—	—	—

Week ended May 2.

Year.	Passengers.	Goods & Sundries	Total for the week.
	$	$	$
1914....	48,334	9,085	57,419
1913....	44,446	10,359	54,805
Increase.	3,888	—	2,614
Decrease	—	1,274	—

For forty-four weeks.

Year.	Passengers.	Goods & Sundries	Total
	$	$	$
1914....	2,123,187	447,123	2,570,310
1913....	1,897,810	415,503	2,313,313
Increase.	225,377	31,620	256,997
Decrease	—	—	—

Week ended May 9.

Year.	Passengers.	Goods & Sundries.	Total for the week.
	$	$	$
1914....	54,479	11,778	66,257
1913....	52,626	9,302	61,928
Increase.	1,853	2,476	4,329
Decrease	—	—	—

For forty-five weeks.

Year.	Passengers.	Goods & Sundries.	Total.
	$	$	$
1914....	2,177,666	458,901	2,636,567
1913....	1,950,436	424,805	2,375,241
Increase.	227,230	34,096	261,326
Decrease	—	—	—

Week ended May 16.

Year.	Passengers.	Goods & Sundries	Total for the week.
	$	$	$
1914....	49,715	11,851	61,566
1913....	48,356	9,456	57,812
Increase.	1,359	2,395	3,754
Decrease	—	—	—

For forty-six weeks.

Year.	Passengers.	Goods & Sundries	Total
	$	$	$
1914....	2,227,381	470,752	2,698,133
1913....	1,998,792	434,261	2,433,053
Increase.	228,589	36,491	265,080
Decrease	—	—	—

JAPAN

Railway Construction Plans—How far the railway construction programme is to be carried out during the current fiscal year is still a pending question in the Imperial Railway Board as the Board changed its chief while negotiations as to the means and ways of railway financing during the current year were still pending between the Board and the Finance Department. If the original plan of the Board is to be carried out without being modified as a result of the negotiations with the Finance authorities, lines with a total mileage of 223 miles 75 chains will be completed during the year.

Details are as follows:

Lines	Sections	Mileage.	Date of C'pletion.
Hokkaido	Yubutsu...Rubeshibe-Shimoutabara	19.40	Sept. 1914
Hokkaido	Soya...Onishibu-Kotombetsu	9.59	Oct. 1914
Hokkaido	Manji...Shibun-Manji	14.70	Nov. 1914
Shinjo	Furukuchi-Kiyokawa	8.59	June 1914
Shinjo	Kiyokawa-Awarume	7.34	Aug. 1914
Shinjo...	Awarume-Sakata...	9.15	Dec. 1914
Taira...	Koiiyama-Miharu ...	7.65	Aug. 1914
Taira...	Taira-Onoshinmachi	20.69	Feb. 1915
Taira...	Taira-Nishiogawa ...	6.18	Feb. 1915
Murakami ...	Shibata-Chujo	8.10	June 1914
Murakami	Chujo-Murakami	12.50	Nov. 1914
Ganyetsu	Nozawa-Tsugawa	15.79	Oct. 1914
Miyazaki ...	Mitsumata-Yawanokuchi	3.37	Aug. 1914
Miyazaki ...	Miyazaki-Akaye	1.94	Jan. 1915
Miyazaki ...	Akaye-Kiyotake	3.22	Jan. 1915
Sendai ...	Kushikino-Sendai	7.33	June 1914
Hojo...	Kisarazu-Minato ...	13.48	Jan. 1915
Miyachi (light)	Kumamoto-Otsu	12.76	June 1914
Nagai (light)	Nashigo-Nagai	7.11	Oct. 1914
Fukagawa (light)	Nita-Wakimoto	5.22	Oct. 1914
Total		196.64	

To this total are to be added those lines already completed and opened to traffic.

They are:—

Lines	Sections	Mileage.	Date of C'pletion.
Sayegi...	Oita-Yozaki	11.33	April 1
Inukai...	Oita-Nakahanda ...	6.79	April 1
Shinjo...	Iwade-Kawawatari	8.62	April 19

The construction expenses of these lines are estimated at 1,300,000 *yen*.

Between Japan and China.—In October last, the Japanese Imperial Government Railways opened a through traffic arrangement between Japan and China by rail via Korea, and have since been operating the through booking of passengers and luggage from principal stations on the Tokaido, Sanyo, and Kyushu Lines to Peking and Tientsin, and *vice versa*. On account of the improvements introduced to the train services on the Korean, the South Manchuria, and the Chinese Peking-Mukden Line on May 1st, the through connections have been increased and the length of journeys shortened, to the immense advantage of through passengers. Formerly, when proceeding by daily connections from Japan to China, passengers have had to stop overnight at Mukden and Shanhaikuan, spending 5 days 4 hours on the journey from Tokyo to Peking, but now a stop-over is necessary only at Shanhaikuan, thus shortening the time spent to just over four days. Furthermore, up to the present month through connections necessitated a stop-over at Mukden and were once weekly, while according to the new timetable, through services are thrice weekly and without any stop-over *en route*, as follows:—

LEAVE.

Shimbashi..	Tues. & Sat.	8.30 a.m.	Tues.	3.50 p.m.
Hiranuma..	,, ,,	9.06 ,,	,,	4.36 ,,
Osaka......	,, ,,	8.33 p.m.	Wed.	6.38 a.m.
Kobe	,, ,,	9.22 ,,	,,	7.32 ,,

ARRIVE.

Tientsin....	Sat. & Wed.	5.03 a.m.	Sat.	6.41 p.m.
Peking	,, ,,	8.45 ,,	,,	9.43 ,,

Shikizan Cable Railway Co.—A charter has been granted by the State Railway Board to the Shikizan Cable Railway Company for the construction of a cable railroad between Sano and Tochino, Ikomagun, Naraken. The proposed line will be 1 mile and 29 chains in length and will cost 200,000 *yen*.

Extension of Existing Lines.—The Imperial Japanese Railway Board has decided to investigate with a view to extending the railways, 303 miles in various parts of the country during the current year.

The following is the program the Railway Board has decided to undertake;

	Miles
IN THE NORTH-EASTERN DISTRICTS	
Between Omagari and Morioka	47
Between Yamagata and Tazawa by way of Sawukawa and Etami	19
Between Noheji and Ominato	38
Between Kawabe and Kizukuri	17
IN THE SAN-IN DISTRICTS	
Between Tottori and Chizu...	20
Between Yonago and Neame	19
IN SHIKOKU	
Between Yamada, Kochi and Susaki... ...	24
IN HOKKAIDO	
Between Uda and Rumoe	9
Between Otokoshi and Futaneuchi	87
NEAR TOKYO	
Between Katsuta and Omiya	13

New Rolling Stock.—The new rolling stock to be constructed by the Imperial Japanese Government Railways during the current fiscal year comprises 109 locomotives, 94 tenders, 207 passenger cars, and 1,693 goods cars.

New Light Railways.—On May 4, charters were granted by the Imperial Japanese Railway Board to four railway companies for the construction of light railways in Chiba-ken and Okayama-ken. The first of these companies, the Katori Railway Company, proposes to lay a steam light railway, gauge 3.6 feet, between Omigawa and Sawara, important commerical centres in Chiba prefecture. The proposed line is 7 miles 30 chains in length and costs 330,000 *yen*. The second is the Hokuso railway company which proposes to construct a light railway, gauge 3.6 feet, in the same prefecture, with a capital of a million *yen*. The proposed line, twenty miles in length, connecting Kinoshita with Urayasu, runs through Chiba prefecture crosswise. The Tobi Light Railway Company, promoted by the Okayama businessmen, will be a steam light railway, gauge 3.6 feet, between Imbe and Toyomura in Okayama prefecture. The projected line will be 11 miles in length and is said to cost 380,000 *yen*. The new line projected by the last of the four companies, the Ushimado Light Railway Company, starts at the terminus of the above-mentioned railway and terminates at Ushimado, Oku-gun, Okayama-ken, being 8 miles 60 chains in length. The construction expenses are estimated at 370,000 *yen*.

MANCHURIA

Feeders for the South Manchuria Railway.—Details concerning the Sino-Japanese agreement *re* the five railways in project in Manchuria and Mongolia are progressing fairly, reports the *Manchuria Daily News*, and continues:—The construction funds amounting to Y30,000,000 are to be raised in European markets.

Traffic Earnings of Changchun Station.—During the year October, 1912, to September, 1913, the arrival of beans at the railway station at Changchun totalled 234,868 tons. During the half-year from October, 1913, to last March, the total arrivals reached 158,718 tons, and a further arrival of 28,410 tons is expected for the remaining half-year ending next September. Calculating on this basis, a falling-off by 47,740 tons will be noted against the present season. The railway traffic receipts at that Station have, however, been nearly as the previous season. From April, 1913, to last March, the total earnings reached Y. 2,552,867 as against Y. 2,556,610 for the preceding fiscal year, the difference in favour of the latter being only Y. 3,743.

South Manchuria Railway Co.—The traffic returns for the month of April gave a daily average of Y62,784, being a decrease from the corresponding month of last year by Y1,909.

THE PHILIPPINES

Operations in 1913.—The following is from the annual report of the Governor-General of the Philippines, under date September 25, 1913:—The program of railroad construction on the island of Luzon by the Manila Railroad Co. has been steadily carried out during the year. The construction of the lines of the Philippine Railway Co. on the islands of Panay and Cebu was practically completed during the fiscal year 1911, but the disposition of certain outstanding minor items caused the final closing of the accounts to be delayed, and to be still unaccomplished at the end of the fiscal year 1913. On August 9, 1913, however, a final bond issue was made, and the matter definitely settled. Since no action has been taken by the Legislature on the proposal to relieve the Company from the obligation to construct a line on the island of Negros, the Governor-General, on June 24, 1913, authorized the extension of time for its completion "until such time, as the Legislature shall have acted on the matter, or until such time as both parties to the contract shall desire its fulfillment."

On the northern lines of the Manila Railroad Co., the bonds of which are not guaranteed by the government, there were completed during the year 33.5 kilometers of grading, while 27 kilometers of track were laid and 13.3 kilometers were put in operation. On the southern lines, the bonds of which are guaranteed, 86 kilometers of grading were completed, 60.5 kilometers of track were laid, and 22 kilometers were put in operation. The total length of line put in operation was 35.4 kilometers. In the course of the year the main line north of Dagupan was declared in full commercial operation as far as South Bauang. The grading on the Baguio line was opened up for practically its entire length, while one of the necessary tunnels was nearly completed and the other well advanced; it is expected that this line will be finished by the beginning of the calendar year 1915.

Early in the fiscal year the bond section extending from Magdalena to Pagsanjan in Laguna Province was put in full commercial operation, thus completing the construction of that branch; and authority was granted, effective February 10, 1913, for the operation of the bond section from Tiaong to Lucena on the main line south. Work has been pushed steadily on the portion of the line beyond Lucena, which is to establish the first through land communication between Manila and the rich hemp-producing provinces of southern Luzon. This has been definitely located, subject to minor changes during construction, for nearly its entire length. At the end of the year the track laid came within 5 kilometers of the average necessary to complete the line, as authorized by Acts. Nos. 1510 and 1905, on September 12, 1918. In all, of the 1,312 kilometers authorized by law the Manila Railroad Co. had constructed at the end of the fiscal year 829 kilometers, of which 761 were in operation, leaving 483 to be constructed. Of this last much the greater part, 417 kilometers, pertain to the southern or guaranteed lines.

The lines of the Manila Railroad Co. were operated with success throughout the year; there were no heavy floods and the track was maintained in good condition for all lines. The company reports an increase in operating revenue for the calendar year 1912 as compared with the preceding year of 56 per cent., while the figures for the first six months of the current year promise a further heavy increase. The Philippine Railway Co. was less fortunate. The islands of Panay and Cebu were visited by severe typhoons, causing considerable damage to the track and bridges of the company and to the agricultural products that compose most of the freight; the traffic in consequence was adversely affected, and the operating revenue fell considerably below that of the preceding year.

Japan

CHOSEN (KOREA)

The Seoul-Wonsan Railway.—Along with the advent of spring, activity is shown with regard to schemes of railway construction in Korea. Work on the unfinished section of the Seoul-Wonsan railway has made more progress than originally expected. Over the entire line, except the section between Sijin and Kosan, 16 miles in length, where the work has met with most difficulty, construction cars are being run from both ends. Construction of dykes along the above section has been almost entirely finished, and 14 tunnels have also been successfully bored, the only portion of work unfinished being that on the interior of the tunnels. Progress has also been shown with regard to the construction of railway bridges, more than 20 in number, and it is expected that at this rate work on the entire line will be finished by the end of August next, and that traffic will be begun the following month.

The Chongjin-Hoiryong Railway.—The survey of the route of the projected Chongjin-Hoiryong railway and of an extension of the Seoul-Wonsan railway has already been begun by three surveying corps, each consisting of about 15 experts. One party is engaged in the survey of the route of the extension of the Seoul-Wonsan line and the two other corps are surveying that of the Chongjin-Hoiryong line. It is expected that the work will be entirely finished by the end of August next. Purchase of the land required will then be begun, and the laying of the rails will be set about early next spring.

GENERAL

Verkne-Udinsk to Kiakhta Line.—It is stated that the Russian Government has definitely decided to construct the railway from Verkne-Udinsk to Kiakhta. The cost of the line it is estimated will amount to about 23,740,000 roubles. Russia has long desired to build a branch of the trans-Siberian line via Kiakhta and Urga to Kalgan, and this is a tentative beginning.

COMPANIES

China Industrial Co.—The Chugoku Kogyo Kaisha or China Industrial Company, held its first ordinary general meeting of shareholders in the Tokyo Chamber of Commerce recently. Mr. Kurachi, the vice-President of the company, presided. Twenty-four shareholders, representing all the shares of the company, were present, including Mr. Nakano, Baron Shibusawa, Mr. Ohashi, Mr. Sun Po-shen, Mr. Chou Chin-piao, Mr. Li Shih-wei, Mr. Hu Tsung-ying, and Mr. Yang Shih Chi.

The chairman presented a report on the proceedings for the term just closed. In part he stated that during the term the company was occupied with the affairs relating to the inauguration of the company and did not set to real work. However, applications for loans to the number of nineteen were received from

China. Three of them for the amount of 11,300,000 *yen* were accepted after proper investigations into the nature of the applications were made. His report having been accepted by the meeting the chairman recommended a statement of accounts for the term together with the following profit and loss account:—

	Yen.
Net profit for the term...	8,911.33
Sinking fund for inauguration expenses	5,714.73
Carried forward to next account	3,196.60

All these accounts were duly carried after debate. Then a revision of the articles of association of the company was proposed and accepted. The revision mainly is in the change of the company's official title and the establishment of offices in Tokyo, Peking, and Shanghai. The company will henceforth go under the name of the China Japan Industrial Development Company, limited.

Baron Nakajima was returned as director from the Japanese side, and Messrs. Yang Shih-chi, Sun Po-shen, Chou Chin-piao and Si Shih-wei as directors, and Mr. Hu Tsung-ying as auditor were elected from the Chinese side.

Green Island Cement Co., Ltd.—The report presented to the shareholders at the twenty-fifth ordinary general meeting reads as follows:—

The Board of Directors have to lay before the shareholders a statment of accounts and balance sheet for the year ending December 31, 1913.

After allowing for Directors' and Auditors' fees, and providing $90,418,89 for depreciation on the Company's buildings, machinery, launches, lighters, etc., as per Articles of Association, the net profit, including the sum brought forward from the previous year, amounts to $102,241.71, which it is recommended should be carried forward to the credit of next year's account.

China Sugar Refining Co., Ltd.—The report of this Company states:—

The General Agents beg to submit to shareholders their report on the Company's business for the year 1913 with a statement of accounts to 31 December last.

The demand for the Company's Sugars has been restricted, partly owing to the troubles in the North during the first few months of the year, and partly to the large accumulation of stocks in China ports of both Japanese and Java white sugars.

The year's working resulted in a loss of $69,060.27, and a balance of $49,264.32 is carried to the debit of profit and loss account.

Shanghai Mutual Telephone Co., Ltd.—The report of the directors for the year ended March 31, 1914, contains the following:—

Telephones in use at the end of the year 5,187.

The amount available for appropriation is Tls. 138,808.57 which it is proposed to distribute as follows:—

To shareholders, Tls. 4 per share 14,540 Shares ... ...Tls.	58,160.00
To directors' fees ... ... „	2,400.00
To the fund for equalization of dividends ... ... „	20,000.00
To reserve fund ... ... „	50,000.00
Carry forward to next year's account ... ... „	8,248 57
	Tls. 138,808.57

TRAMWAYS

Shanghai Tramways.—The returns of the Shanghai Tramways (Foreign Settlement) for week ended April 22, are as under:—

	1914. $	1913. $
Effective receipts (after deducting loss by depreciation of subsidiary coinage)	18,739.73	16,128.34
Passengers carried. . .	1,011,045	810,962
Car miles run	62,382	50,915

The loss by depreciation of subsidiary coinage for the week was $5,652.01 equal to 24.52 per cent. of the gross cash collected on the cars as compared with $4,523.95, equal to 23.26 per cent. for the corresponding week last year.

Week ended April 29.

	1914. $	1913. $
Effective receipts (after deducting loss by depreciation of subsidiary coinage)	19,027.06	14,671.77
Passengers carried. . .	1,025,714	733,068
Car miles run	62,112	48,984

The loss by depreciation of subsidiary coinage for the week was $5,797.42 equal to 24.72 per cent. of the gross cash collected on the cars as compared with $4,084.20 equal to 23.27 per cent. for the corresponding week last year.

Week ended May 6.

	1914. $	1913. $
Effective receipts (after deducting loss by depreciation of subsidiary coinage)	19,952.45	18,559.36
Passengers carried. . .	1,057,096	941,406
Car miles run	64,570	53,892

The loss by depreciation of subsidiary coinage for the week was $6,201.34 equal to 24.95 per cent. of the gross cash collected on the cars as compared with $5,306.79 equal to 23.37 per cent. for the corresponding week last year.

Week ended May, 13.

	1914. $	1913. $
Effective receipts (after deducting loss by depreciation of subsidiary coinage)	19,120.79	17,688.02
Passenger carried. . . .	1,052,624	887,496
Car miles run	62,567	52,856

The loss by depreciation of subsidiary coinage for the week was $6,024.02 equal to 25.27 per cent. of the gross cash collected on the cars as compared with $5,136.31 equal to 23.69 per cent. for the corresponding week last year.

Week ended May 20.

	1914. $	1913. $
Effective receipts (after deducting loss by depreciation of subsidiary coinage)	17,760.41	17,355.94
Passengers carried . . .	972,366	884,149
Car miles run	62,262	53,410

The loss by depreciation of subsidiary coinage for the week was $5,548.11 equal to 25.23 per cent. of the gross cash collected on the cars as compared with $4,956.68 equal to 23.43 per cent. for the corresponding week last year.

BANKS

International Banking Corporation.—The board of directors of the International Banking Corporation at its meeting on April 10 voted a semi-annual dividend of $3 per share, thus putting the shares on a 6 per cent. basis. This reflects the steady progress which this bank has made since 1910, when its profit and loss showed only $55,000, and it was not paying dividends. But in 1912 the profit and loss having been steadily increased to $600,000, dividends were commenced on a 5 per cent basis. The statement of December 31, 1913, shows deposits of over $20,000,000 and undivided profits of $773,000.

Deutsch-Asiatische Bank.—The annual report of the Deutsch-Asiatische Bank, reviews the financial status of China and suggests that the second instalment of the big loan should be used to play floating debts and foreign creditors and for the redemption of notes issued by the southern provinces. The report further states that construction work on the Hankow railway will commence at once and that the Shantung railway again paid a dividend of seven and a half per cent. The report also dwells on the improvements progressing in China as evidenced by the reform measures being energetically and quietly instituted by President Yuan Shih-kai.

Russo-Asiatic Bank.—At the General Meeting which took place in St. Petersburg on May 20th the Russo-Asiatic Bank declared, for the year 1913, a dividend of 10 %.

PERSONAL

Baron Shibusawa, the well-known Japanese financier, visited China early in May.

Mr. W. W. Rockhill, formerly American Minister at Peking, who has been investigating conditions in China, returned to America in May.

Mr. N. J. Stabb, Chief Manager of the Hongkong and Shanghai Banking Corporation has left for England on leave.

Mr. George Anderson, the United State Consul General at Hongkong, left for the United States on May, 13, by the *Empress of Russia*. Mr. Anderson is going home partly on official business and expects to return to Hongkong in September.

Professor Anderson, the new Mining Adviser to the Republic, accompanied by Mr. Erik Nystrom, has arrived in Peking.

Mr. J. Stewart, of the Kailan Mining Administration, in Tientsin is joining the Salt Administration.

M. Rozier, of the Banque de l'Indo-Chine at Hankow, is going to Tientsin to take the place of M. Cornu.

Mr. J. J. Bahnson, General Manager in China and Japan of the Great Northern Telegraph Company, has received the Third Class Order of the Rising Sun in recognition of services rendered and Mr. I. Sorensen, of the Shanghai office of the company, has received the Sixth Class of the Order of the Sacred Treasure.

Mr. W. R. Randolph has been appointed Chief Engineer of the American Section of the Hankow-Szechuan Railway. Mr. Randolph has been acting as Chef Engineer for some time, but he has only just recently received the official appointment.

Mr. F. A. Harris, who has been to Hankow for the past three months, where he has been Chief Accountant of the Hankow-Canton Railway, has returned to the Peking-Mukden Railway at Tongshan.

The *Peking Gazette* reports that Men Ken-yuan, the late Tutuh of Kirin, contracted a loan of $10,000,000 for the reorganisation of the administration with a German firm. The Provincial Government of Kirin has sanctioned the loan.

MINING

Mines in Indo-China.—From a recent return it appears that the output of coal in Indo-China in 1912 was 427,000 tons, against 437,000 tons in 1911, of which the Hongay mine produced 306,000 tons, or about 75 per cent. The output of zinc ore, chiefly concentrated at Lang-Hit and Thanh-Mof, amounted to 28,387 tons of which 25,172 tons, with a value of f.3,401,500, were exported. In 1912 240 tons of tin and tungsten ores were produced in the mines of Pia Ouac. The output of gold amounted to kg.85, the only mine at work being at Bong-Miu. The different mines gave employment to 12,000 persons, 150 being Europeans and 11,900 Asiatics, of whom 2,000 were Chinese.

Export of Tin From Hongkong.—There were some notable developments in the export trade in tin from Hongkong in 1913, the United States being the chief factor in the change. The total amount of tin exported during the year fell off materially from the exports of 1912, which were in fact abnormally large as a results of the sudden development of mining plants in Yunnan Province on a modern scale, as well as the sudden release of stocks held in the interior by interference with transportation facilities, reports Mr. George E. Anderson, American Consul-General at Hongkong. Shipments to the United States, however, increased largely, thus marking a breaking away of the American trade from its European connections in which tin was purchased in the Far East and shipped to Europe and thence to the United States, whereas now larger portions of the exports are proceeding direct. Exports of tin from Hongkong to the United States in 1913 amounted in declared value to $1,632,213, as compared with a declared value of $1,404,115 in 1912 and $798,941, in 1911, the exports previous to that time being too small to merit separate enumeration in the returns. This increase in shipments to the United States has been directly at the expense of Europe. Returns of the Hongkong General Chamber of Commerce show that the exports of tin from Hongkong, in slabs of 112 pounds, during the past two years have been as follows:

Destination.	1912 *Slabs*	1913 *Slabs*
United States	27,551	36,790
Great Britain	24,752	8,047
Continental Europe	63,772	32,575
Total	116,075	77,412

The movement of tin to the United States occurred chiefly in the first two quarters of the year, the declared value for the March quarter having been $764,092 and that for the June quarter $511,135, the half year constituting more than three-fourths of the whole. The year's trade opened briskly with comparatively high prices and with a decided advantage in favor of Chinese tin as compared with tin from the Straits Settlements and from other parts of the world. A fall in prices in the summer, however, temporarily stopped the movement. With the beginning of the new year shipments have been renewed at a largely increased rate.

The output of the metal from the Yunnan mines during the year is placed by the trade at about 14,000 tons, as compared with about 10,000 tons in 1912, but owing to various disturbances and disorder the total output anticipated by the trade was probably not reached. There was some accumulation of stocks in Hongkong during the latter part of the year, the close of the season witnessing about 13,500 piculs of 133⅓ pounds each, valued at about $750,000, on hand. Exports during the opening months of 1914 have been large.

Korean Mining Companies.—The Seoul Mining Co., operating the Suan Concession, in Whang Hai province, Korea, reports the following results for March 1914:

Stamps working	40
Time, days	28.75
Ore crushed, tons	6,340
Total recovery	$47,832
Operating expenses	22,500
Net earnings	25,332

The Oriental Consolidated Mining Co. reports that in January the Kuk San Dong 40-stamp mill worked only 15 days, and the Tabowie 80-stamp mill 25 days, on account of ore and water shortage, respectively. The 240 stamps worked 24.7 days, crushing 24,705 tons, yielding $143,757. The net profit was $47,292. In February the tonnage of 21,954 yielded $149,084. There was a further shortage of water. Lessees are working at the Kuk San Dong mine. It is intended to lease the Candlestick mine, and large numbers of Koreans came to the property to be on hand to get a portion. The Taracol cyanide plant treated 1797 tons of concentrate, yielding $45,576, with 83% recovery. The results are gratifying.

Tin Mining In Siam.—A local company has been formed under the title of the Nai Sok Tin Mining Company, Ltd., and is now in process of registration according to Siamese law, says a recent issue of the *Bangkok Times*. The capital of the new venture is Tcs. 150,000 divided into 1,500 shares of Tcs. 100 each. Seven hundred fully paid shares and Tcs. 10,000 in cash will be paid to the vendors and promoters, as purchase price of the property and for the services of the latter. The whole of the 800 shares offered for public subscription have already been taken up. The property acquired by the Company has hitherto been worked by Towkay Kaw Joo Chin, and is situated in the district of Langsuan. It consists of a block of land about 102 rai in extent situated on a hill eight miles long by one wide. The lease is held for twenty-five years from the Siamese Government, dating from July 126. The mine has been reported on by Mr. R. Schulz. From the town of Langsuan it takes three days by river to reach Paksong, the landing place for the mine, and from this point the mine is distant some four to five hours by elephant.

Kailan Mining Administration. — The total output of the Administration's mines for the week ended March 4, amounted to 60,720.50 tons and the sales during the same period to 54,685.08 tons.

Week ended April 11, output 61,176.90 tons, sales 60,442.56 tons.

Week ended April 18, output 63,136.47 tons, sales 56,919.48 tons.

Week ended April 25, output 61,810.55 tons, sales 63,644.11 tons.

Week ended May 2, output 65,146.57 tons, sales 64,151.37 tons.

Week ended May 9, output 65,961.46 tons sales 64,524.02 tons.

Operations in Manchuria.—A correspondent writes from Mukden under date May 13:—The Penshit'ing Coal Mining Co. seems to be obtaining a large quantity of coal especially the fine dust called "mei," which is largely used in open fireplaces, mixed with clay for cooking, etc. Formerly the hill above the town was like a lot of large rabbit warrens, where natives laboriously dug the coal in a most primitive manner, but now a large tunnel runs into the mountain at its base and thousands of tons come out in trucks. One notices that the Company have erected two large blast furnaces presumably to work the fine iron ore near by. There is an abundant supply of suitable limestone all around and hence the iron industry, which in by-gone ages is said to have flourished in Penshit'ing may once more revive. The town is on the T'aitze river which runs past Liaoyang, and is about thirty miles south by east of Mukden on the Antung line. Further east there are known to be splendid and easily worked beds of first class iron ore, especially magnesian, yielding, even to crude native methods 60 per cent. of metal, and coal always near.

FINANCIAL

German Finance in China.—In the course of the discussion of the Foreign Affairs Estimates in the Budget Committee of the German Reichstag the Reporter said that German influence in China was apparently receding, and demanded more German salaried Consuls and trade experts. Herr von Jagow, the Foreign Secretary of State, declared that Belgium had secured particularly important concessions in China, but he could not say whether Belgian capital alone was concerned. He referred to the preliminary agreements in regard to harbour and railway concessions obtained by the French Bunque Industrielle de Chine, in return for a loan of f. 150,000,000, and expressed regret that German finance held aloof. The Government, he said, keenly desired the participation of German finance in the development of China. Besides the Deutsch-Asiatische Bank, a second German group was being formed which would provide finance and industry with a basis for far-reaching activity in China. Herr von Jagow added that the development of the Consular service was receiving full attention. A third commercial expert, to reside at Canton, would be appointed as soon as a suitable person was available.

Further information bearing on the matters mentioned above is given in a lengthy communication from the Peking correspondent of the *Frankfurter Zeitung*, who, after dealing with recent enterprise on the part of certain nations in China, reports that German financial circles who are not associated with the German Asiatic Bank intend to form a new group which is specially to handle industrial problems in China.

The German Foreign Office has been approached in the matter, and the Secretary of State is said to have promised his support. It is proposed to proceed independently of the German Asiatic Bank, although no trade contest is in contemplation, as the scope of activity is to be divided. Thus the latter institution will continue to occupy itself with the financing of the Chinese State, whilst the new group will devote itself to the economic side of the question, with which the German Asiatic Bank, as shown by experience had been unable to deal in consequence of other demands made upon it.

The existing group under the circumstances should not be opposed to the proposed new group, but should the correspondent remarks, welcome the creation of a second group which would be able to complement it; and rightly expect that the financial powers now behind the German Asiatic Bank will also participate in the work of the new group when it has first gained a footing in China. It is not intended to form the new syndicate on a narrow minded basis, as it is also to include Austrian financial interests. When the new group has been brought into existence a corresponding combination of German manufacturers is to be formed for the promotion of trade with China and the carrying out of industrial works, as may be assumed, financed by the new group.

The correspondent proceeds to state that a number of foreign groups have recently been constituted for the "industrialisation" of China, most of which permit of Chinese participation. Foreign companies which have on their name-signs also the word "Chinese," are popular in China, especially when the promoters belong to a friendly nation, and they are certain of every support when important Chinese interests are invested in them. For these reasons it is suggested that the new group should be formed as a German-Chinese company, and that it should seek a connection with influential Chinese circles as soon as possible, whilst at the same time it is hinted as being desirable that the group should deal with great China and not be located in Shantung, with Tsingtau as its base.

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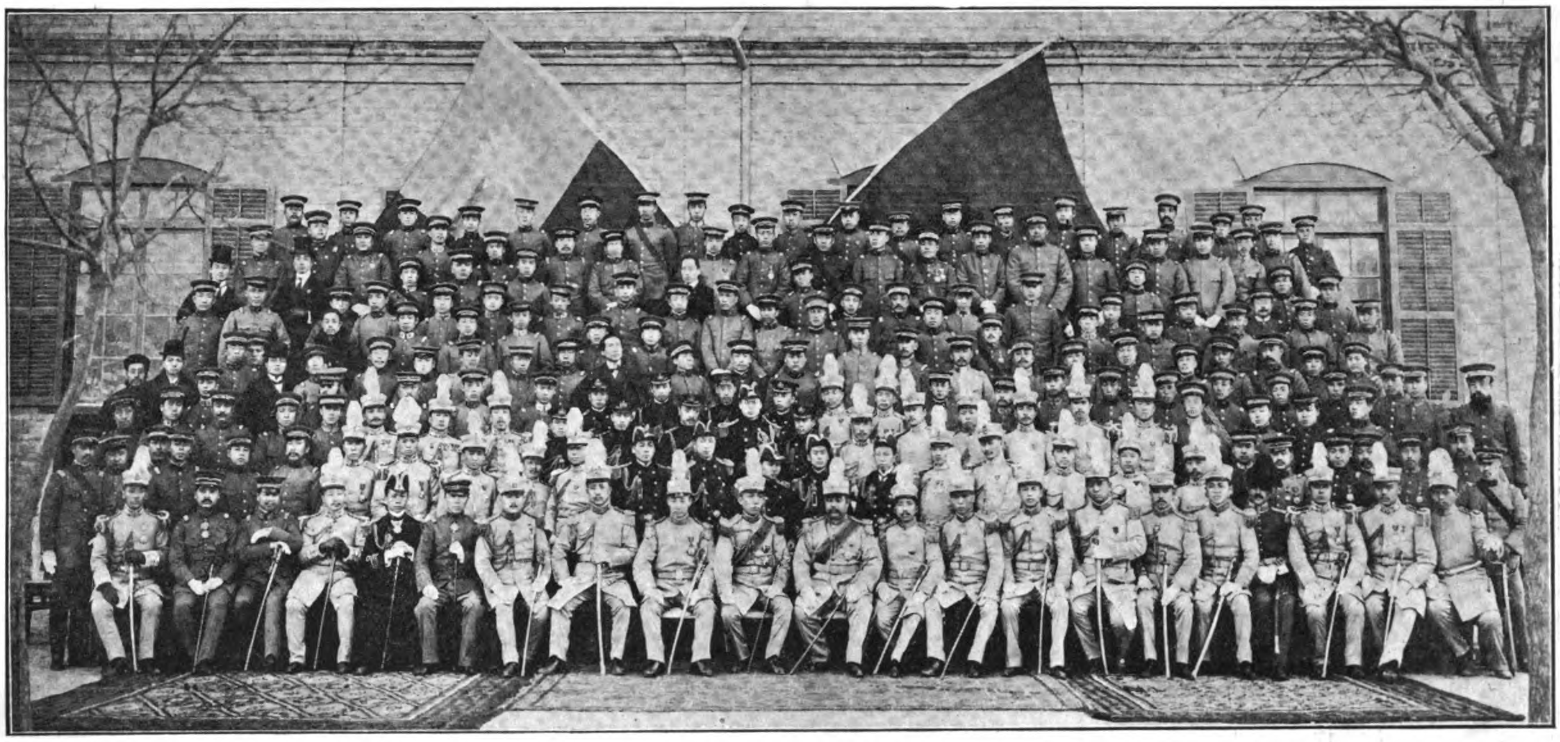

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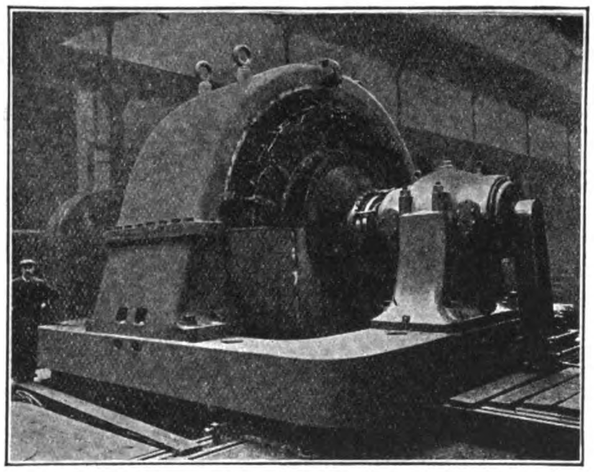

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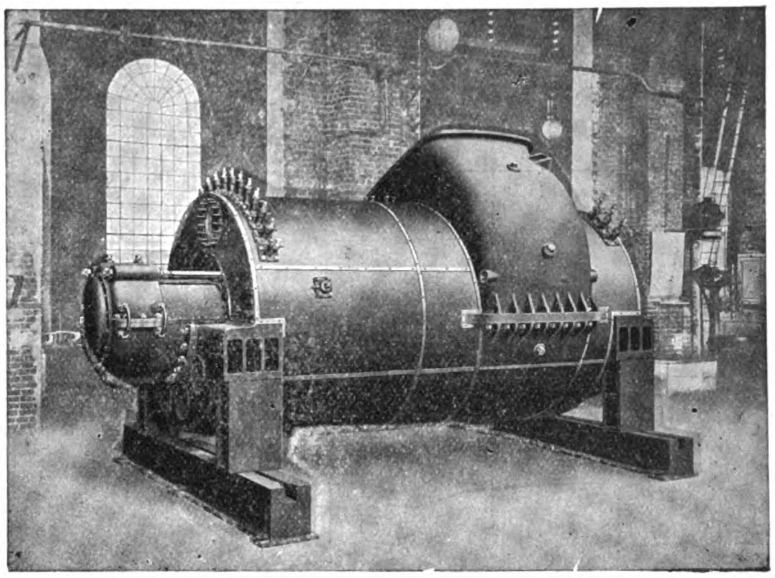

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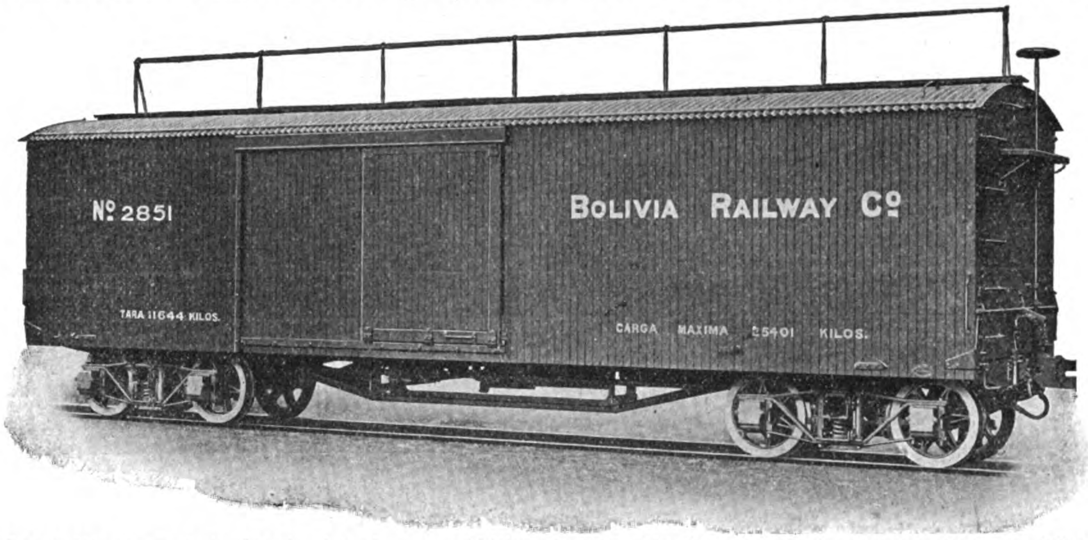

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DAILY			SATURDAYS ONLY				MONDAYS ONLY	DAILY		
MIXED		MAIL	EXPRESS				EXPRESS	MAIL	MIXED	
		A.M. 9.40	P.M. 7.30	dep.	Tientsin East	arr.	10.55	3.37		
	A.M.	9.50	7.40	arr.	Tientsin Central	dep.	10.45	3.27		
	5.15	10.10	7.55	dep.		arr.	10.35	3.07		9.16
	9.45	P.M 1.43	10.48	dep.	Tsangchow	dep.	8.00	12.01		4 53
	P.M. 1.52	4.52	A.M. 1.27	dep.	Techow	dep.	5.37	P.M. 9.15		12.28
A.M.	5.59	7.41	3.59	arr.	Tsinanfu	dep.	3.12	6.30		P.M. 8.30
7.10		8.01	4.09	dep.		arr.	3.02	6.10	6.30	A.M.
9.59		10.38	6.23	dep.	Taianfu	dep.	1.08	3.53	3.48	
P.M. 12.50		A.M. 1.29	8.36	dep.	Yenchowfu	dep.	P.M. 11.04	1.15	1.02	
3.56		4.48	10.54	dep.	Lincheng	dep.	8.46	A.M. 10.11	P.M. 9.46	
6.12		6.56	P.M. 12.30	arr.	Hsuchowfu	dep.	7.02	7.54	7.20	
	1.45	7.16	12.40	dep.		arr.	6.52	7.34	11.25	
A.M.	7.14	11.20	4.10	arr.	Pengpu	dep.	2.33	3.01	6.05	
5.45		11.30	4.20	dep.		arr.	2.23	2.51	A.M.	8.48
10.20		P.M. 3.10	7.39	dep.	Chuchow	dep.	A.M. 10.45	P.M. 11.20		4.13
P.M. 12.03		4.30	9.04	arr.	Pukow	dep.	9.10 P.M.	9.50 A.M.		2.20 P.M.

Read Upwards.

Yenchowfu-Tsiningchow Branch		
Daily	STATIONS	Daily
P.M. 2.30 dep.	Yenchowfu	arr. 12.02 P.M.
3.33 arr.	Tsiningchow	dep. 11.00 A.M.

Lincheng-Tsochuang Branch				
Daily		STATIONS	Daily	
A.M. 11.20	P.M. 5.50 dep.	Lincheng	arr. 8.08	2.38
P.M. 12.28	6.58 arr.	Tsochuang	dep. 7.00 A.M.	1.30 P.M.

NOTE: Express Trains with Dining, Sleeping, 1st and 2nd class cars are operated from Tientsin to Pukow on Saturdays and vice versa on Mondays. One 3rd class car is attached to each train only for use of passengers' servants, if any.

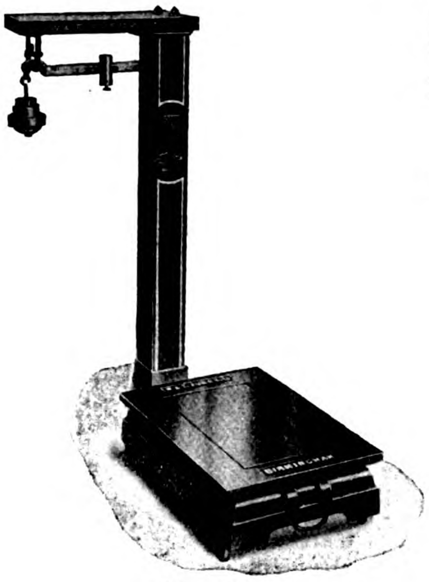
Sleeping Accommodation may be reserved on application to the Traffic Manager, Head Office, Tientsin or to the Chief Traffic Inspector, Tsinanfu or Pukow. It is highly advisable to apply for reservation at the earliest possible date in order to prevent disappointment.

In addition to 1st class fares, an extra fee of $5.00 will be charged for each berth on the Express Service.

By Order,

Tientsin, 1st May, 1914.

The Traffic Manager.



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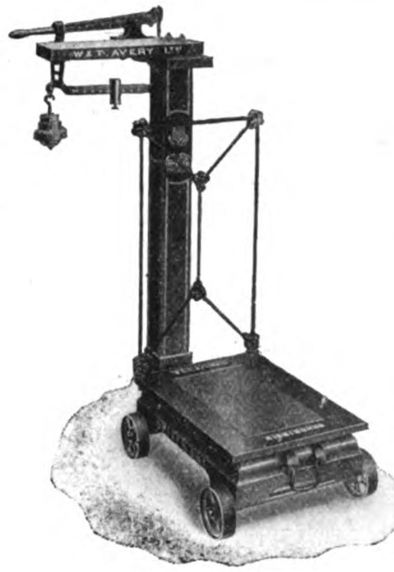
BRITISH MANUFACTURE THROUGHOUT.

For use on TEA, COFFEE, RICE AND RUBBER ESTATES AND FOR GENERAL PURPOSES.

To Weigh lb.	Platform Length inches	Platform Width inches
400	21½	15
600	25	16
800	26	17
1,000	26	17
1,200	28	20
1,500	28	21
2,000	33	25
2,500	34	26



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The ANGLO-JAPANESE TRADING Co.,

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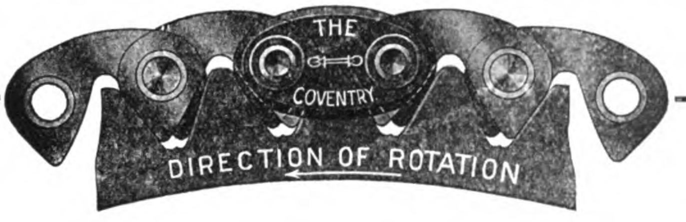
Sole Manufacturers: Telegrams: "THERPINENE," Hull. (A. B. C. Code 5th Edition.)

RUDD & OWEN,

(Dept. L.) HULL, England.



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Sterling Reserve Fund £1,500,000 @ 2/- = $15,000,000
Silver Reserve Fund..............$17,650,000
Reserve Liability of Prop'rs...$15,000,000

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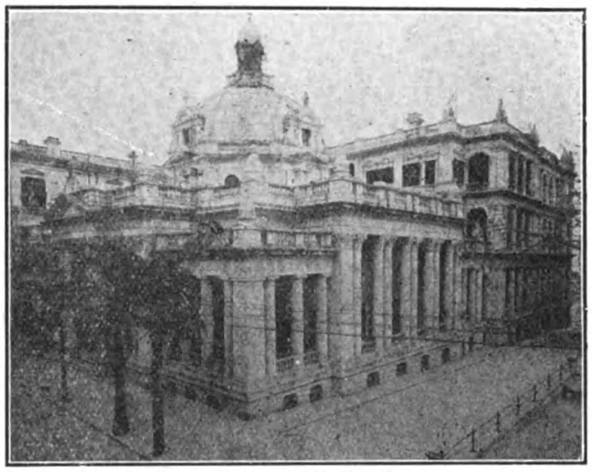

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HEAD OFFICE, 60 WALL STREET, NEW YORK

LONDON OFFICE, 36 BISHOPSGATE STREET, E.C.

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ESTABLISHED 1880.

Head Office: Yokohama, Japan

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Capital Paid up .... *„ 30,000,000*
Reserve Fund .... *„ 18,550,000*

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K. Kodama,
Manager.

RUSSO-ASIATIC BANK

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Capital contributed by Chinese Government Kuping Tls. 3,500,000
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86 Branches in Russia and Siberia and 23 Branches in Europe and Asia.

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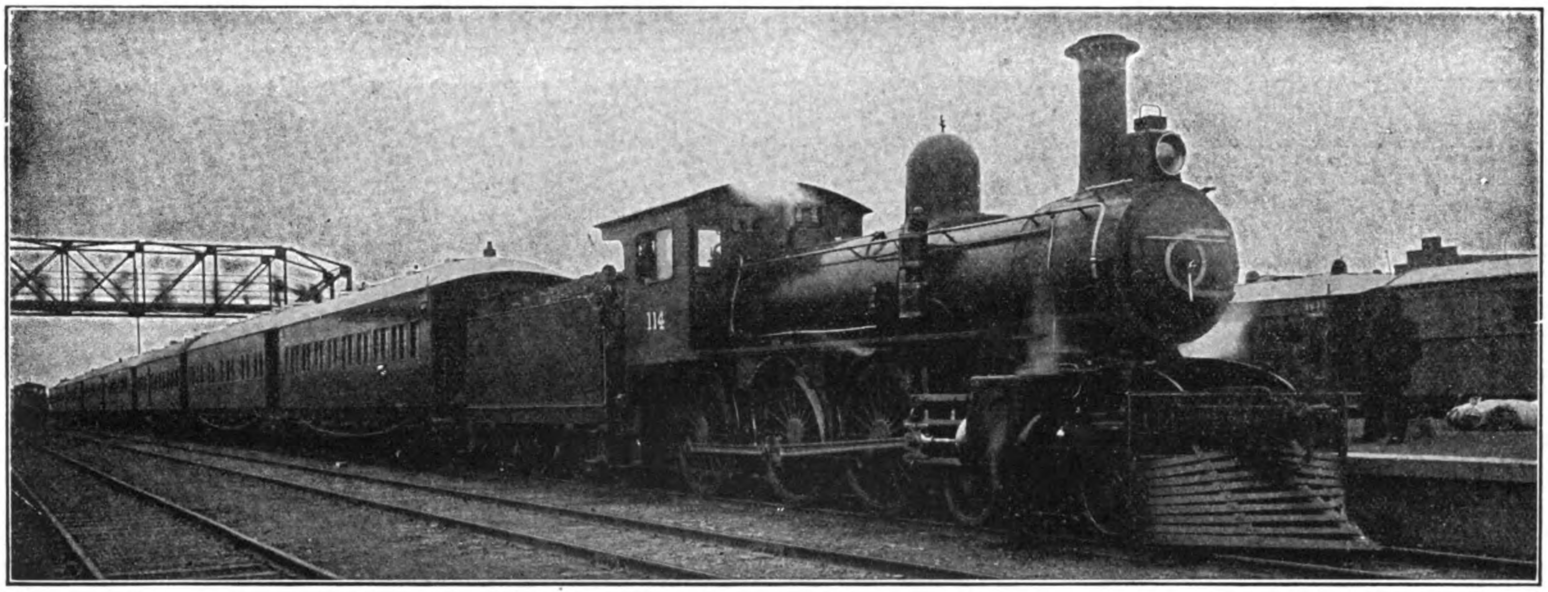

TRAIN DE LUXE AT TIENTSIN SETTLEMENT STATION

CHINESE GOVERNMENT RAILWAYS OF NORTH CHINA

THROUGH SERVICE FROM PEKING TO MUKDEN, CONNECTING AT MUKDEN WITH THE SOUTH MANCHURIA EXPRESS FROM TRANS-SIBERIAN ROUTE: AT PEKING CONNECTION IS MADE WITH THE PEKING-HANKOW RAILWAY FOR HANKOW AND YANGTSZE PORTS, AND INTERMEDIATE POINTS REACHED BY THE CHEN-TAI LINE TO TAIYUANFU, THE TAO-CHING LINE, AND THE PEINLO RAILWAY TO KAIFENGFU AND HONANFU. CONNECTION IS ALSO MADE AT PEKING WITH THE PICTURESQUE KALGAN LINE, "THE ROAD TO THE GREAT WALL."

THE RAILWAYS OF NORTH CHINA PASS THROUGH THE MOST INTERESTING PART OF CHINA

PEKING: THE CAPITAL, WITH ITS WALLS, PALACES, TEMPLES AND TOMBS.—**TIENTSIN:** THE GREAT TRADE CENTER OF NORTH CHINA.—**TONGSHAN:** THE LARGEST MINING AND INDUSTRIAL TOWN IN THE COUNTRY.—**SHANHAI-KWAN:** WHERE THE GREAT WALL ENDS AT THE SEA.—**NEWCHWANG:** THE BUSY COMMERCIAL PORT OF MANCHURIA.—**MUKDEN:** THE ANCESTRAL HOME OF THE MANCHU DYNASTY. A MINIATURE PEKING, WITH ITS WALLS, IMPERIAL PALACES, TEMPLES AND TOMBS.

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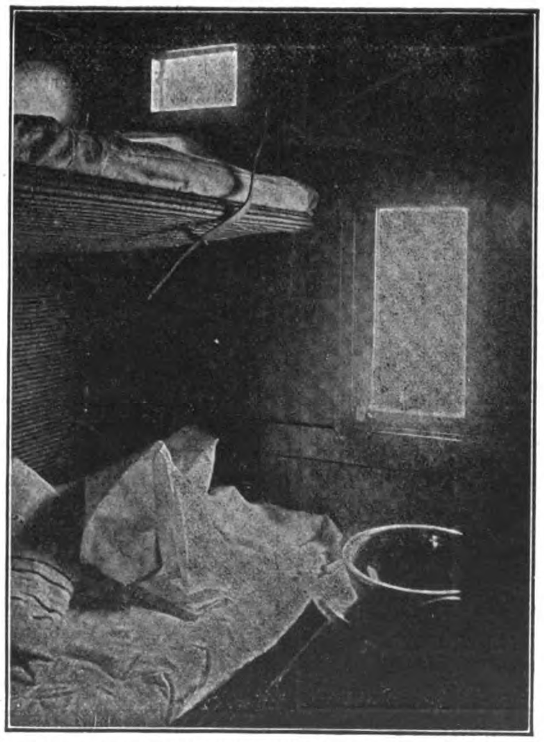

FIRST CLASS SLEEPING BERTH TRAINS DE LUXE

THE THROUGH TRAINS ARE EQUIPPED WITH BUFFET AND DINING CAR SERVICE, AND A COMFORTABLE, MODERN TRAIN DE LUXE OF COMPARTMENT SLEEPING COACHES HAS BEEN PLACED IN OPERATION THIS SEASON TO CONNECT WITH THE THROUGH SERVICE OF THE TRANS-SIBERIAN AND SOUTH MANCHURIAN RAILWAYS

For further information apply to any office in America or Europe of

The Cie. Internationale Des Wagons-Lits, Thos. Cook & Sons, or Railways of North China

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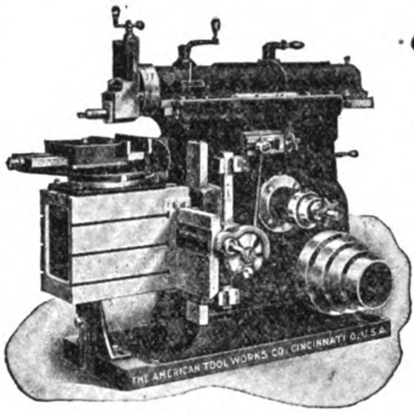
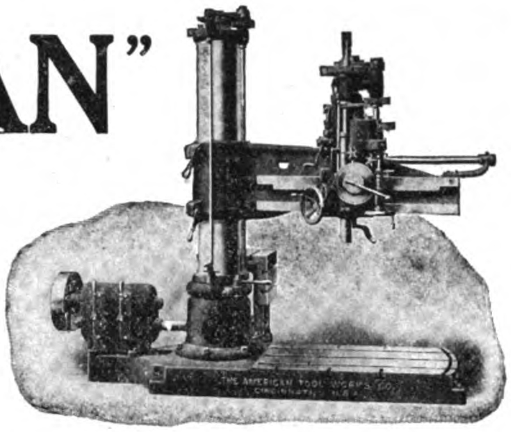
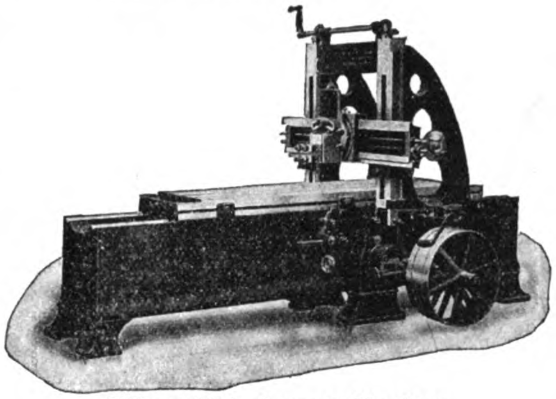


15 in. to 30 in. Stroke.



2 ft. to 7 ft. Arms.



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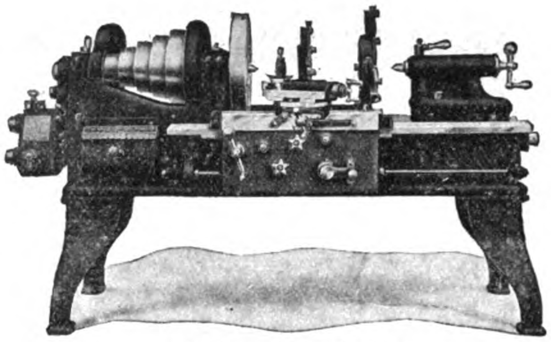
All tools arranged for either Belt or Electric Motor Drive.

We Export to all parts of the world.

Catalog J free on request.



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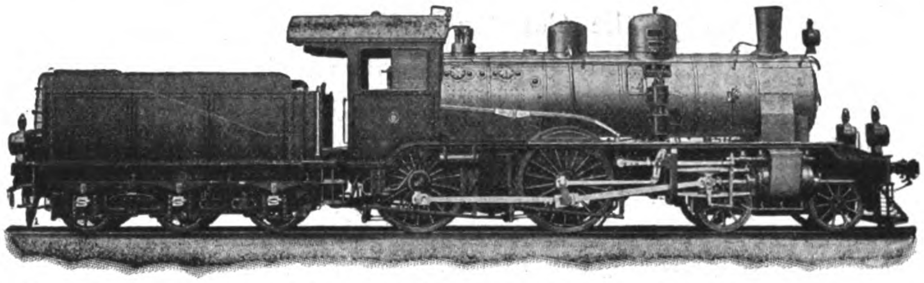

4-6-0 Superheated Steam Passenger Engine with 8-wheeled Tender of the Shantung Railway Company

REPRESENTATIVES

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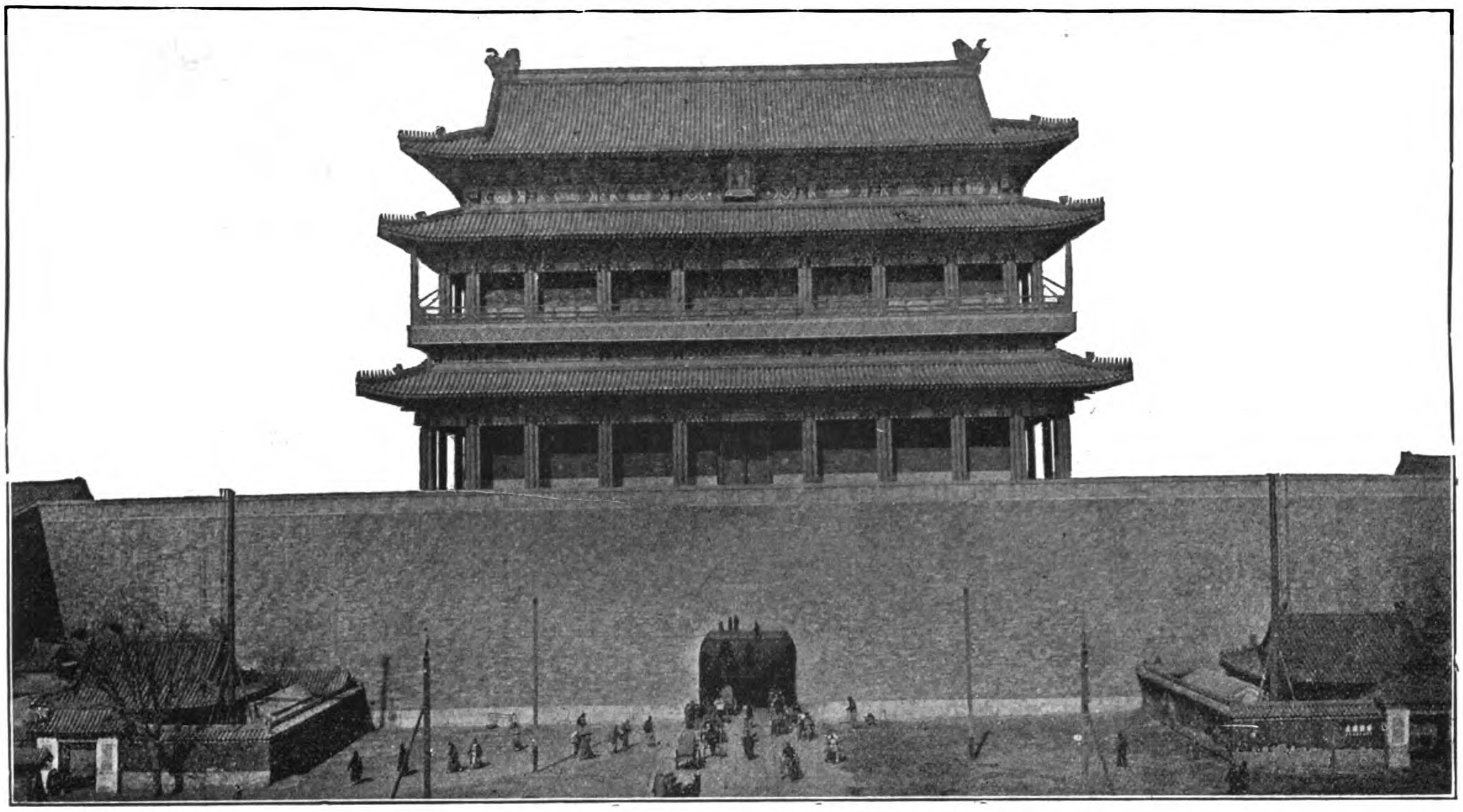


THE CHIEN MEN GATE, PEKING, TERMINUS OF THE PEKING-HANKOW LINE

CHINESE GOVERNMENT RAILWAYS

PEKING-HANKOW LINE

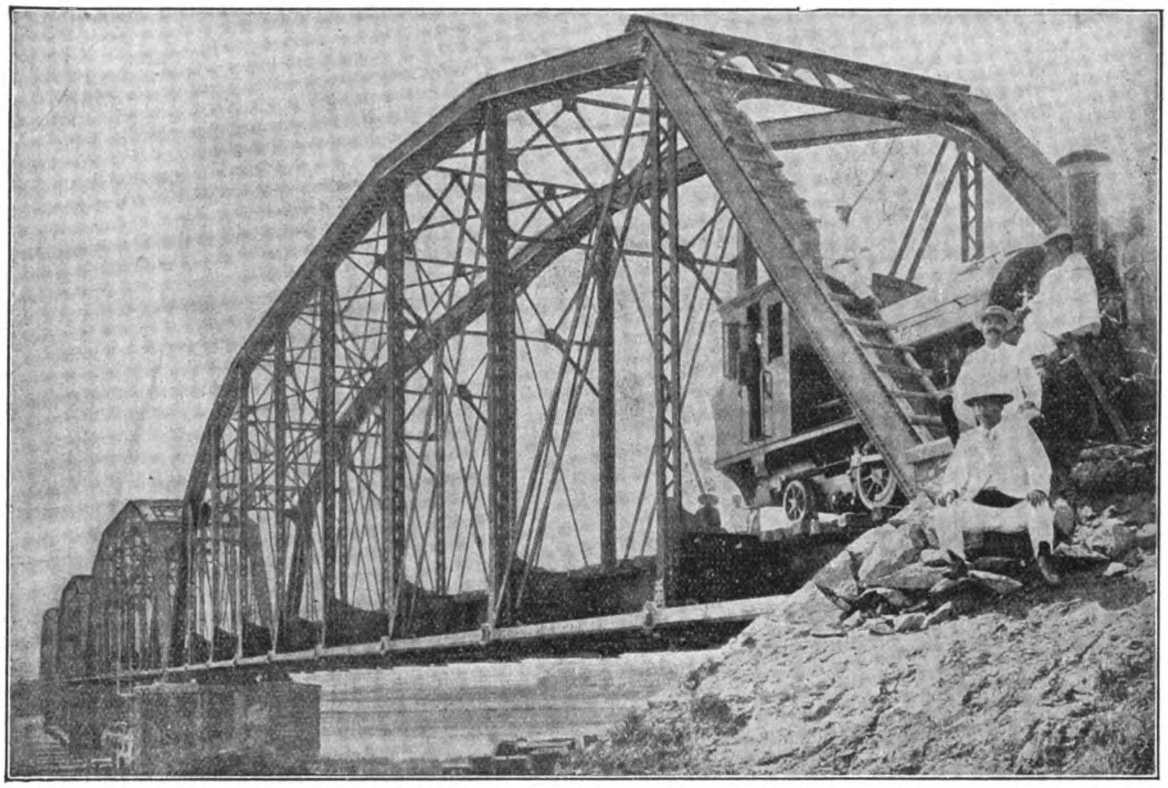
"THE ROAD THROUGH THE HEART OF CHINA"

Avoid the Cold and Rough Weather in the Sea Trip between Shanghai and the North by the more comfortable Route up the Yangtsze to Hankow, and from there via the Ching-Han Railway to Peking, where through connections for Europe are made with the Trains de Luxe of the Government Railways of North China.

This line passes through the Heart of the Country and enables the traveller to and from Europe to catch a glimpse of Old China. Ancient walled cities, temples and pagodas are seen from the comfortable seats of the weekly trains de luxe operated by this line. From Peking, the great capital of the oldest civilization in the world, the train departs from the famous Chien-Men and carries the traveller through the historical and legendary portions of the Country, to the modern industrial center at Hankow—the Chicago of China. Connections are made with the Cheng-Tai Railway at Chengtingfu, with the Tao-Ching Line at Sin Siang-sien, and at Chengchowfu with the Pienlo Line.

A weekly express train de luxe leaves Peking every Tuesday, and Hankow every Friday, making the trip of over 700 miles in less than thirty hours.

For information apply to any office of the International Sleeping Car Co. or Thos. Cook and Sons.



4-200 foot spans, Taiwan Railway, near Taipeh City, Formosa, Weight 600 tons

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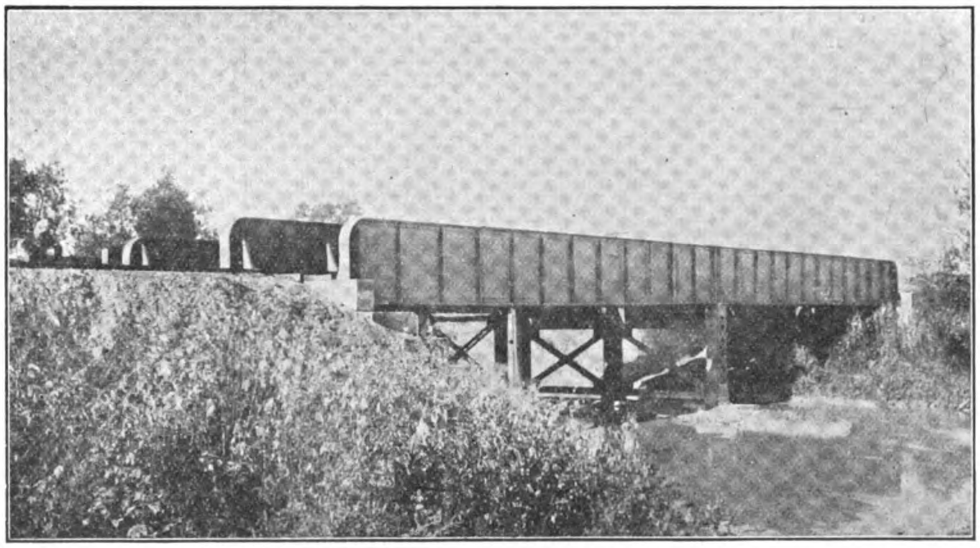

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THREE EXPRESS SERVICES DAILY, WITH RESTAURANT AND SLEEPING CARS

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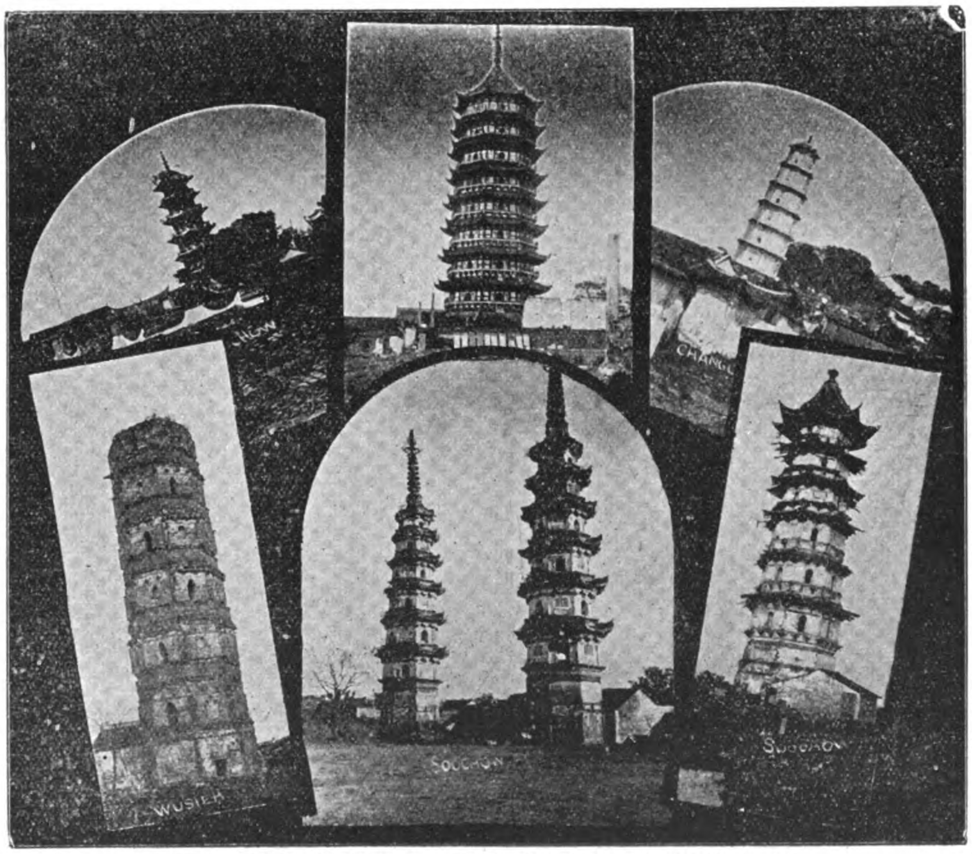
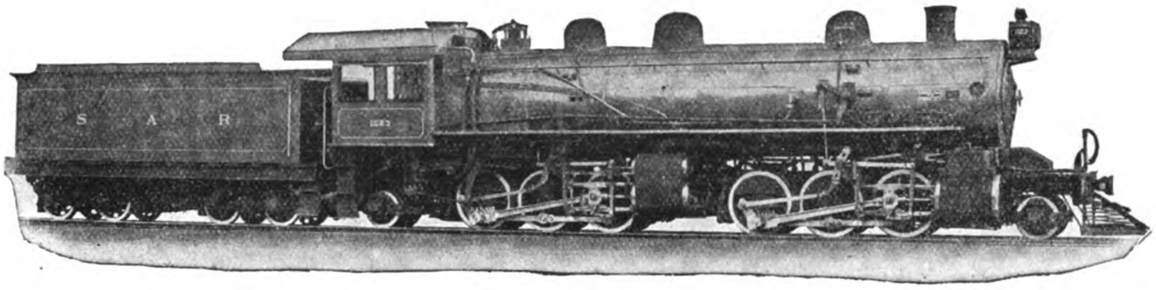


SOME OF THE PAGODAS ALONG THE LINE OF THE S. N. R.

DELIGHTFUL WEEK END EXCURSIONS

77.7 PER CENT INCREASED LOADS

BY MALLETS ON SOUTH AFRICAN RAILWAYS



Total Weight of Engine, 230,000 pounds; Weight on Driving Wheels 196,000 pounds; Diameter of Driving Wheels 46"; Boiler Pressure 200 pounds; Cylinders 18" and 28½"×26"; Tractive Power, 47,700 pounds.

Mallets have greatly simplified the problem of handling the large volume of goods traffic between Witbank and Germiston, on the South African Railways.

These Mallet locomotives are hauling trains of 1,600 tons gross as against 900 tons gross hauled by the locomotives which they replaced, an increase of 77.7 per cent.

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These Mallet locomotives are the result of years of study, experiment and development. They include only features which have been thoroughly proven in service, skillfully combined in proportions known to be correct.

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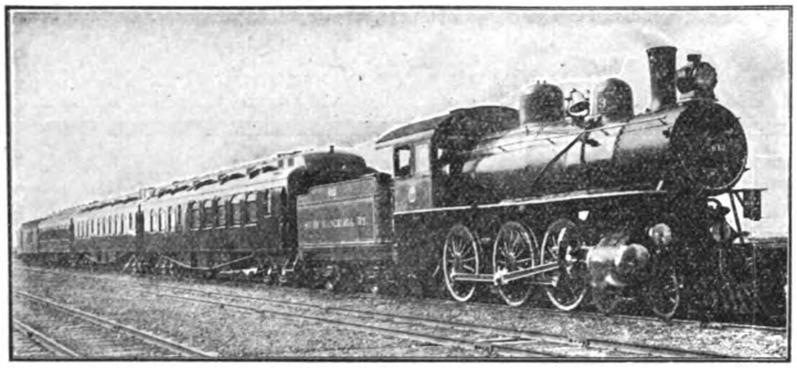
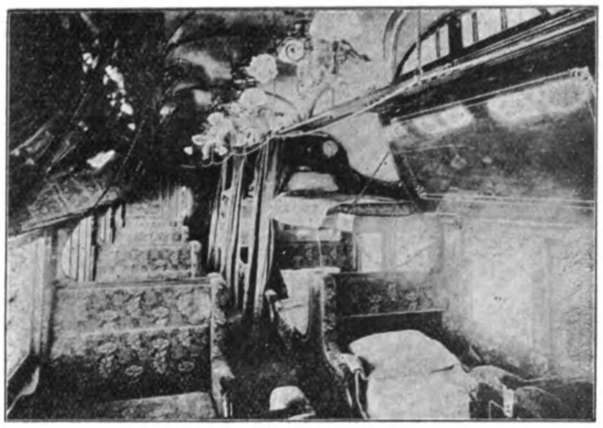


THE SOUTH MANCHURIA EXPRESS

Shanghai	to London	in	13½	days
Tokio	„	„	13¼	„
„	„ Peking	„	3½	„
Dairen	„ Moscow	„	8¾	„

South Manchuria Railway



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THRICE WEEKLY EXPRESS TRAINS.—Composed of excellently equipped SLEEPING, DINING, and 1st CLASS CARS. Operated between DAIREN and CHANGCHUN in connection with the TRANS-SIBERIAN ROUTE and SHANGHAI MAIL STEAMERS.

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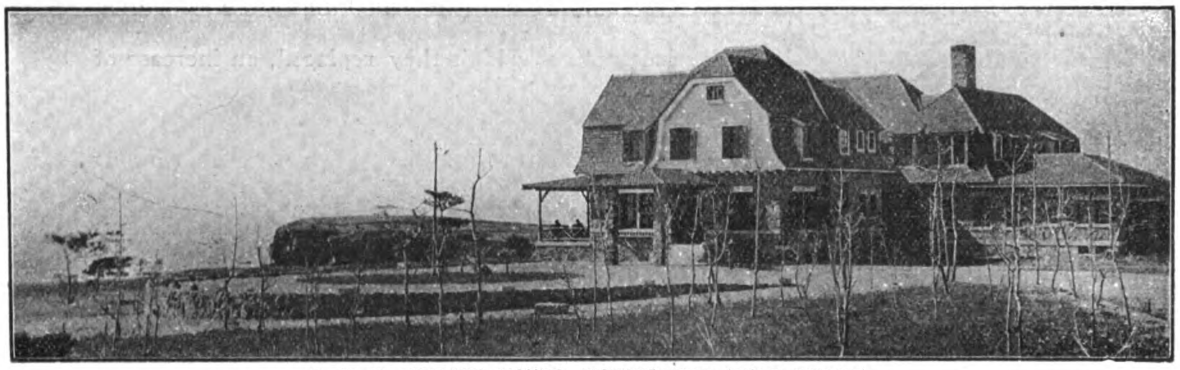
CONNECTIONS AT MUKDEN.—These Express Trains connect at MUKDEN with the PEKING-MUKDEN RAILWAY running via TIENTSIN and with the newly organized MANCHURIA-CHOSEN THRICE WEEKLY EXPRESS SERVICE between Changchun and Fusan; the MUKDEN-ANTUNG LINE (now running throughout on standard gauge) connecting with the KOREAN RAILWAY; by this route the journey between Europe and Japan is shortened by two days, and the sea voyage considerably reduced.

OTHER STEAMER CONNECTIONS AT DAIREN.—Regular Steamship Services are maintained from DAIREN to MOJI, KOBE, CHEMULPO, TIENTSIN, CHEFOO, TSINGTAU, and other ports in Japan and China.



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RAILWAY HOTELS.—YAMATO HOTEL (Tel. Add.: "Yamato") at DAIREN, PORT ARTHUR, MUKDEN, CHANGCHUN, and HOSHIGAURA, all managed by the Company on European lines and providing comfortable accommodation.
At Hoshigaura ("Star Beach"), the finest seaside resort in North China, 5 miles from Dairen, in addition to the hotel, there is a large number of bungalows (for hire at moderate terms), situated in a charming cliff garden and surrounded by beautiful scenery.

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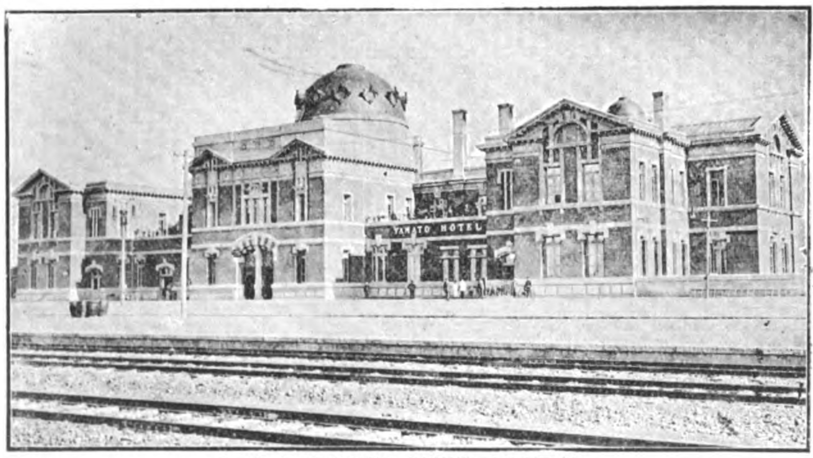
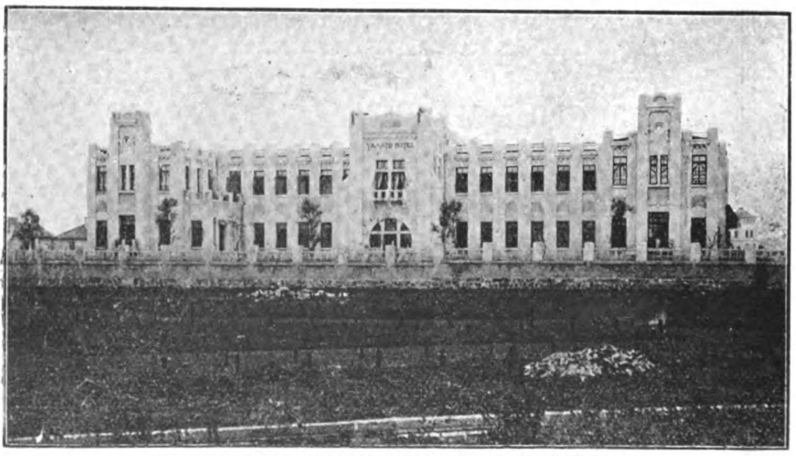


S. M. R. YAMATO HOTEL, MUKDEN



S. M. R. YAMATO HOTEL, CHANGCHUN

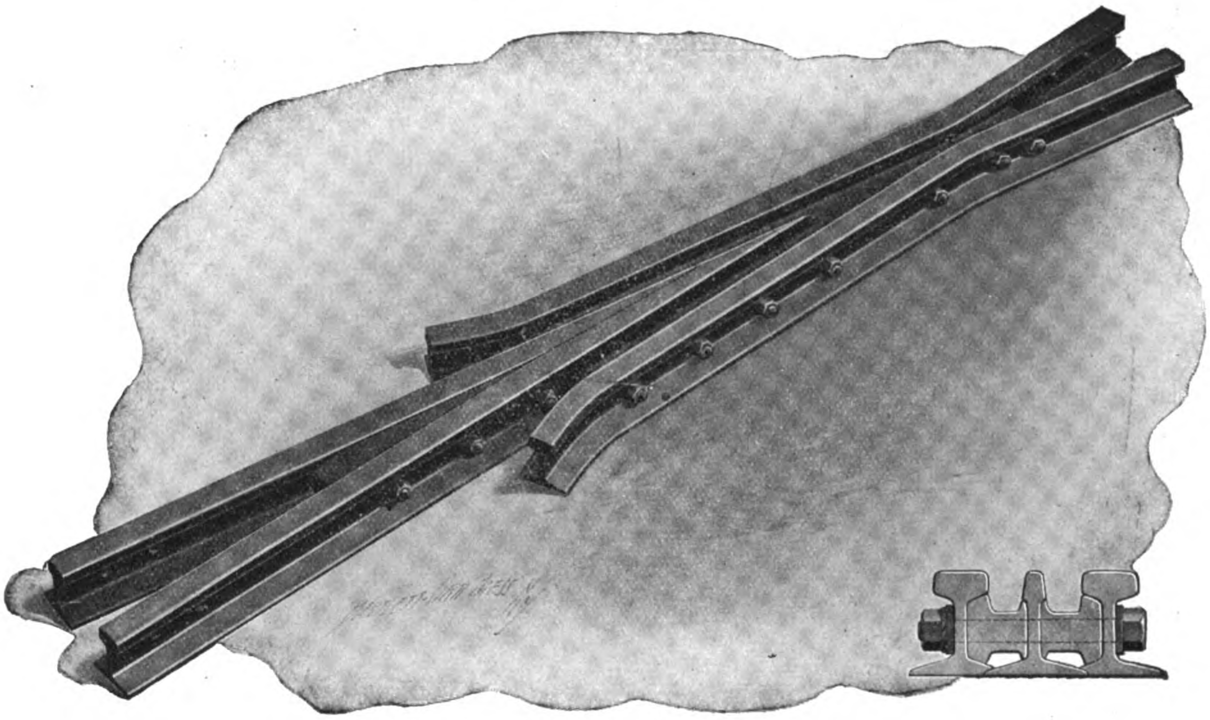
SOUTH MANCHURIA RAILWAY COMPANY, DAIREN, MANCHURIA

Tel. Add.: "MANTETSU" -:- Codes: A. B. C. 5th Ed., A-1, and Lieber's

The United States Steel Products Co.

24A KIANGSE ROAD, SHANGHAI

Manufacturers of Bessemer and Open Hearth Steel



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Chosen Railways

Quickest Communication between Japan and { Europe / China

Most Important and Interesting Route in Round-the-World Journeys

(Time schedules revised on May 1st, 1914)

Chosen-Manchuria Express

Tri-weekly Express Service between Fusan and Changchun.

Leaves Fusan 9.50 p.m. every Tuesday, Wednesday and Saturday.

Leaves Changchun 5.45 p.m. every Monday, Thursday and Friday.

Excellent 1st and 2nd Class Sleeping and Dining Cars are taken. Connections:—

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With the Tokyo-Shimonoseki Limited Express through the Fusan-Shimonoseki Ferry Service.

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Mukden	$2\frac{1}{2}$ days
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Moscow	11 „
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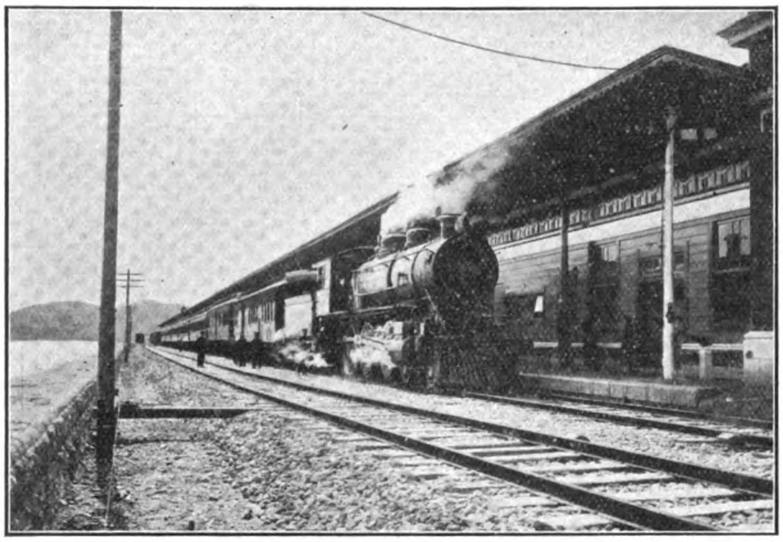
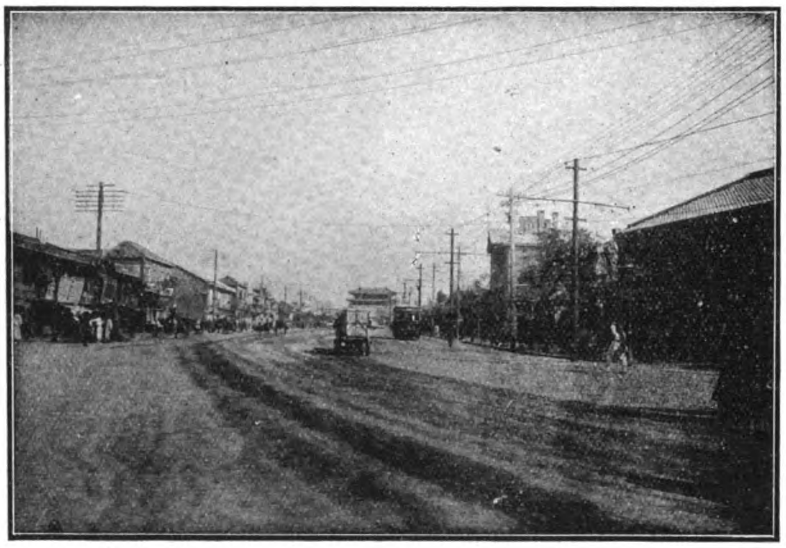
Two Express Trains run daily between Fusan and Antung, and connect with the Fusan-Shimonoseki Ferry Service.

1st, 2nd and 3rd Class Cars are taken, besides either 1st and 2nd Class Sleeping Car or Dining Car is attached. These trains run conjointly with trains on the Antung-Mukden Line, and facilitate passenger traffic to or from Peking, Dairen, Changchun, etc., providing an important through service between Japan, Chosen and China.



EXPRESS TRAIN LEAVING THE FUSAN PIER.



A STREET IN KEIJYO (SEOUL)

Through Passenger Traffic

Through tickets from principal stations on the lines of the Chosen Railway to Hsinmingfu, Shanhaikuan, Tientsin, Peking, Harbin, Manchuria, Tsitsikar, Vladivostock, Habarovsk, etc., besides principal stations on the lines of the Japanese Railways and the South Manchuria Railway, are issued.

Hotels

Under the direct management of the Railways.

Fusan Station Hotel ***Shingishu Station Hotel***

Good Accommodation, Best Attendance, Moderate Rates.

Ticket Agencies

Messrs. Thos. Cook & Son, The International Sleeping Car Company and The Nordisk Resebureau.

FOR FURTHER PARTICULARS PLEASE APPLY TO

The Railway Bureau of the Government-General of Chosen,

Cable Add: "SENTETS" **Ryusan, Chosen.** Code Used: A. B. C., 5th Edition.

TURBINE PUMPS

Special Features:

Absence of Thrust Bearings.

Automatic Differential Hydraulic Balance.

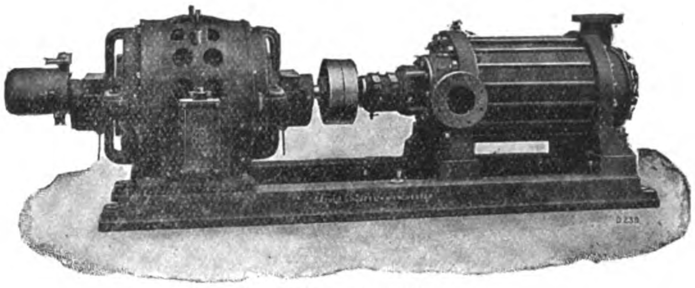
High Efficiency.

Low First Cost.

Accessibility.

Adaptability for increased or decreased number of Chambers.

For High or Low Lifts.



Six Chamber Pump.

Capable of Delivering 650 Gallons per minute, 612 feet head, 1,450 revolutions per minute, coupled to open protected type motor with wound rotor.

Write for our Filter Booklet No. 50.

Full particulars and prices with lists for Users on application to

These pumps are suitable for driving either by motor, water turbine, steam turbine, high speed steam engine, or by belts or ropes. They may be relied upon to run for long periods without examination. Numerous pump installations carried out by us have been running efficiently for many years without having been opened out, and are giving entire satisfaction

Mather & Platt, Ltd.

THE ORIGINAL MAKERS OF THE TURBINE PUMP.
NEARLY 40 YEARS' EXPERIENCE.
MANCHESTER and LONDON.

The Broughton Copper Co., Ltd., Manchester.

Copper Smelters and Manufacturers.-Fluid Compressed Hydraulic Forged

COPPER, BRASS AND BRONZE

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For Marine, Locomotive and other purposes.

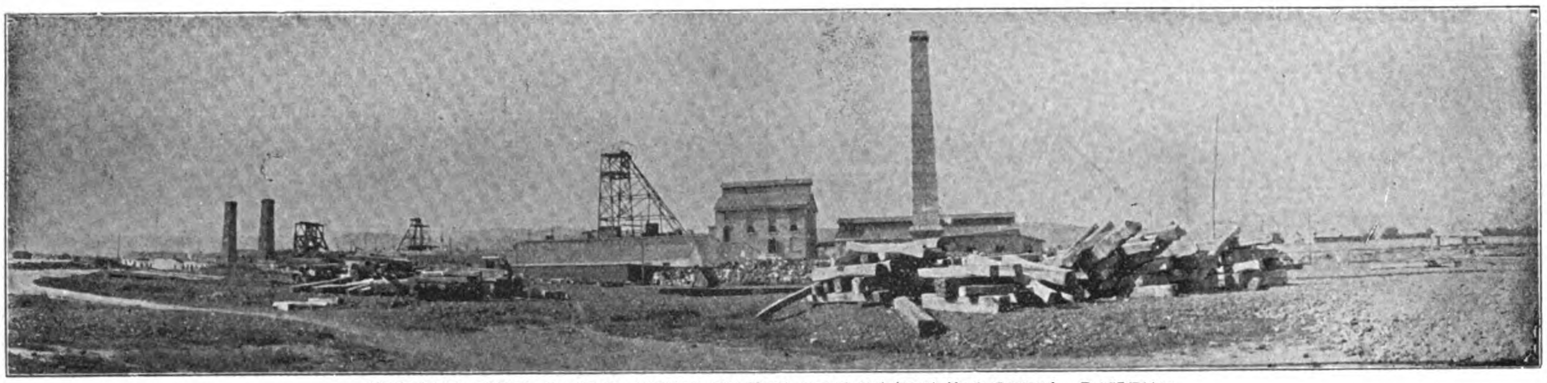
Ingots, Rods, Sheets and Plates. – Electro-Coppering and Alloys.

CHINESE GOVERNMENT RAILWAYS

THE TAO-CHING RAILWAY

TAOKOU TO CHINGHUA

(CHINESE GOVERNMENT HONAN LINE)



GENERAL VIEW OF COAL MINES ON THE LINE OF THE TAO-CHING RAILWAY

"China's Road of Anthracite"

THE TRAINS OF THIS LINE CONNECT AT SIN-SIANG-SIEN WITH THE THROUGH SERVICE OF THE PEKING-HANKOW RAILWAY. IT TAPS THE GREAT ANTHRACITE COAL DEPOSITS OF SHANSI, AND CONVEYS THE PRODUCTS OF THE MINES TO THE NEAREST NAVIGABLE RIVER.

THE PIENLO RAILWAY

(KAIFENG-FU TO HONAN-FU)

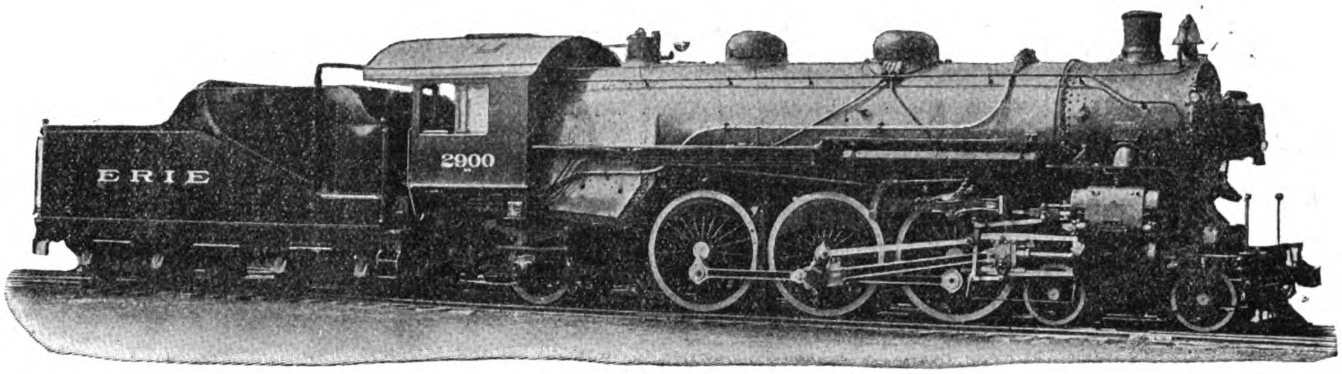
"THE FIRST SECTION OF THE PROJECTED CENTRAL TRUNKLINE"

CHUNG-HUAN TEMPLE, KAIFENG-FU.

The line connects with the through service of the **Peking-Hankow Railway at Tcheng Tchéou, enabling the traveller to visit Kaifengfu, the provincial capital of Honan, and the old capital of the Empire at Honanfu.**

Lima Locomotive Corporation

Builders of all Classes Motive Power. Capacity 720 to 1,000 per year



Heavy Pacific Type Built for Erie Railroad

LIMA HEAVY PACIFIC TYPE

This locomotive combines the latest improvements and developments in design, materials and economic devices for saving fuel, etc.

Built for the **ERIE RAILROAD** for heavy fast passenger service where maximum capacity was desired.

GENERAL DIMENSIONS AS FOLLOWS:

Cylinders, 27 × 28 inches	Weight on drivers, 176,000 lbs.
Driving wheel base, 14 ft.	Total Weight, 287,000 lbs.
Total Wheel base, 36 ft. 2 inches	Tractive Power, 40,700 lbs.
Drivers, diameter 79 inches	Factor Adhesion, 4.24
Boiler, straight locomotive type	Superheater, Schmidt
Boiler, diameter 79 inches	Valve motion, Baker

Our **PLANT** is equipped with the latest and most improved machinery, which enables us to build any type or size locomotive required.

Write our Agents for any information you desire and a copy of our catalogue.

HOME OFFICE

1096 SOUTH MAIN STREET, LIMA, OHIO, U.S.A.

AGENTS
SHEWAN, TOMES & CO.,
PEKING, CANTON, SHANGHAI, TIENTSIN, CHINA

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CABLE ADDRESS
SHAYLOCO

AGENTS
SAMUEL, SAMUEL & CO.,
YOKOHAMA TOKYO, KOBE, SHIMONOSEKI, JAPAN; TAIPEH, FORMOSA

中華民國政府吉長鐵路行車時刻表

CHINSE GOVERNMENT RAILWAYS KIRIN-CHANGCHUN LINE.

TIME TABLE.

STATIONS.		DOWN TRAINS. Daily. Mixed.	DOWN TRAINS. Daily. Mail.	STATIONS.		UP TRAINS. Daily. Mail.	UP TRAINS. Daily. Mixed.
TOUTAOKOU	dept.	**2.20**	7.30	KIRIN	dept.	**2.25**	7.05
CHANGCHUN	arr.	**2.32**	7.42	KIUCHAN	arr.	**2.43**	7.23
	dept.	**2.42**	7.50		dept.	**2.45**	7.28
KALUN	arr.	**3.14**	8.19	KUTIENTZE	arr.		7.42
	dept.	**3.19**	8.22		dept.	**3.00**	7.43
YINMAHO	arr.	**3.46**	8.47	HUAPICHANG	arr.	**3.14**	7.57
	dept.	**3.51**	8.49		dept.	**3.16**	8.02
HSIACHIUTAI	arr.	**4.05**	9.02	CHAOCHIATIEN	arr.		
	dept.	**4.10**	9.04		dept.	**3.39**	8.25
YINGCHENGTZE	arr.	**4.21**	9.14	TUMENLING	arr.	**3.54**	8.41
	dept.	**4.27**	9.16		dept.	**4.04**	8.51
TUMENLING	arr.	**4.50**	9.39	YINGCHENGTZE	arr.	**4.26**	9.12
	dept.	**5.00**	9.49		dept.	**4.28**	9.17
CHAOCHIATIEN	arr.			HSIACHIUTAI	arr.	**4.38**	9.28
	dept.	**5.16**	10.04		dept.	**4.40**	9.30
HUAPICHANG	arr.	**5.38**	10.24	YINMAHO	arr.	**4.53**	9.44
	dept.	**5.43**	10.26		dept.	**4.55**	9.46
KUTIENTZE	arr.			KALUN	arr.	**5.21**	10.14
	dept.	**5.58**	10.40		dept.	**5.23**	10.16
KIUCHAN	arr.	**6.13**	10.55	CHANGCHUN	arr.	**5.51**	10.46
	dept.	**6.18**	10.57		dept.	**5.57**	10.52
KIRIN	arr.	**6.38**	11.15	TOUTAOKOU	arr.	**6.10**	11.05

NOTICE:—"dept."=Departure. "arr."=Arrival. Light type figures=A.M. time. Heavy type figures=P.M. time.
1st May, 1914, and until further notice.

ANDERSEN MEYER & CO.

ENGINEERING DEPARTMENT

4 and 5 Yuen Ming Yuen Road, Shanghai

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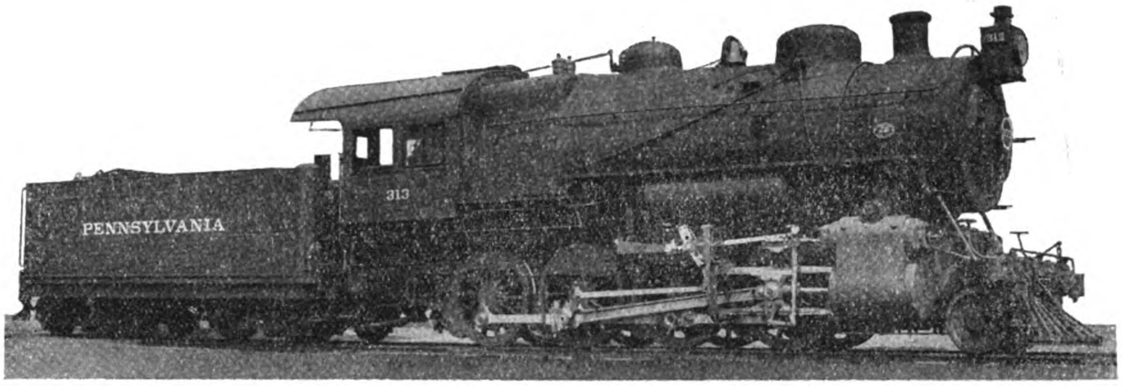
GENERAL ELECTRIC CO. OF NEW YORK
Electric Light, Power, and Railway Apparatus, Electric Supplies.
BRITISH THOMSON-HOUSTON CO., LD. OF RUGBY
Electric Engineers and Manufacturers.
BUDA CO. OF CHICAGO,
Railway Material, Track Supplies, etc.
THE McCONWAY & TORLEY CO.,
Janney Car Couplers.
C. T. HAM MANUFACTURING CO.,
Lanterns and Lamps.
BOLTE & WEYER CO.,
Gasoline Lighting Systems.
KUEFFEL & ESSER CO.,
Drawing Materials and Surveying Instruments.
THE FERRO MACHINE & FOUNDRY COMPANY,
Gasoline Stationary & Marine Engines.
THE AVERY CO. INC.,
Agricultural Implements.
THE H. W. JOHNS-MANVILLE CO.,
Asbestos Goods, Steam Packing, etc.
A. & P. STEVEN,
Lifts.
AJAX FIRE ENGINE WORKS,
Chemical Fire Engines.
DEMPSTER, MOORE & CO.,
Machine Tools.
CLAY MACHINE CO.,
Kerosene Stationary & Marine Engines.
DE LOACH MANUFACTURING CO.,
Wood Working Machinery.
THE SULLIVAN MACHINERY CO.,
Mining Machinery.
THE GOULDS MANUFACTURING CO.,
Pumps and Hydraulic Machinery.

MACHINERY AND ENGINEERING SUPPLIES

RAILWAY MATERIAL, ELECTRIC LIGHT AND POWER PLANTS

Consolidation Type Locomotives

Locomotives of the Consolidation (2-8-0) type have been in use since 1866. These engines, with nearly 90 per cent. of the total weight available for adhesion, are specially suitable for heavy freight service. In the larger sizes the firebox is usually placed above the driving-wheels in order to secure sufficient grate area.



CONSOLIDATION TYPE LOCOMOTIVE, PENNSYLVANIA R. R.

Cylinders, 25″×28″
Driving-wheels, diameter 62″
Steam Pressure, 205 lbs.
Grate Area, 55 sq. ft.
Water heating surface, 3,049 sq. ft.
Superheating surface, 623 sq. ft.
Weight on driving-wheels, 213,700 lbs.
Weight, total engine, 244,800 lbs.
Tractive Force, 49,200 lbs.

The Consolidation engine illustrated in one of 194 locomotives recently built by The Baldwin Locomotive Works for the Pennsylvania R. R. These locomotives, with driving-wheels 62″ in diameter, are suitable either for slow-speed work on heavy grades, or for service in level districts where higher speeds are attained. The boiler has a superheater and brick arch. The Walschaerts valve motion is applied, and the gears are controlled by a screw reverse mechanism.

Heavy locomotives, properly designed for the work to be done, and equipped with fuel saving devices, effect important economies in the cost of railway operation.

Agents for China:—ARNHOLD, KARBERG & Co., SHANGHAI, TIENTSIN, HONGKONG and HANKOW

Agents for Japan:—SALE & FRAZAR, Ltd., TOKYO.

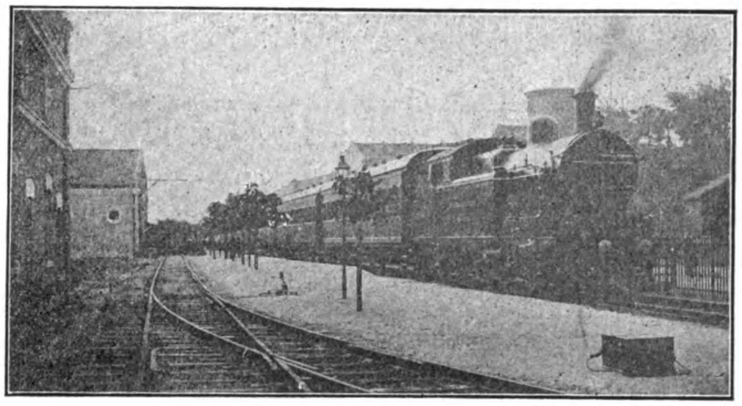
THE BALDWIN LOCOMOTIVE WORKS

PHILADELPHIA, PA., U. S. A.

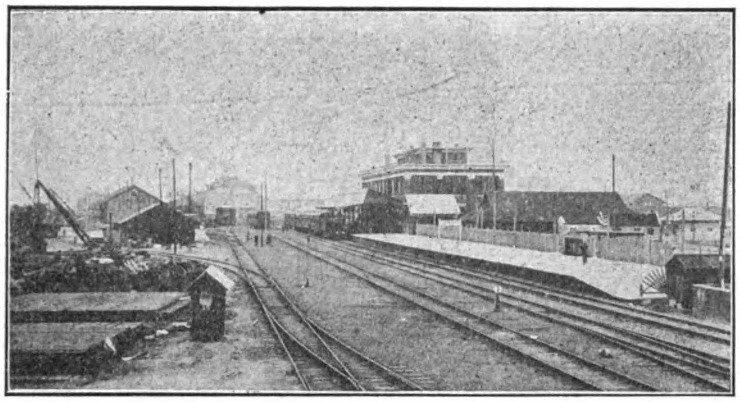
Cable Address:—"BALDWIN PHILADELPHIA"

CANTON-KOWLOON RAILWAY

VIEWS ON THE BRITISH SECTION (22 MILES) **VIEWS ON THE CHINESE SECTION, 89 MILES. (Chinese Government Railways)**

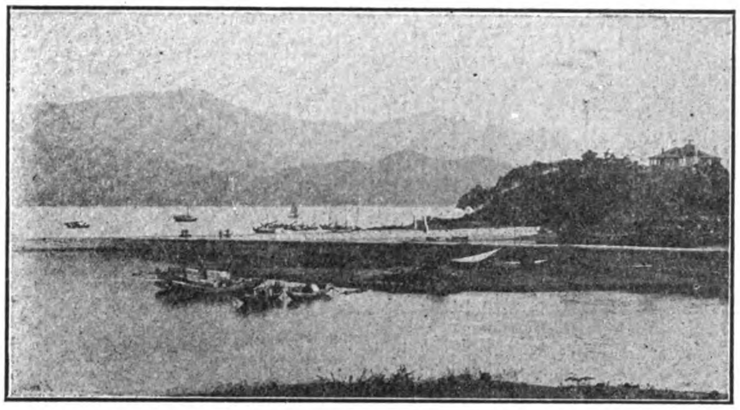


TEMPORARY STATION AT KOWLOON

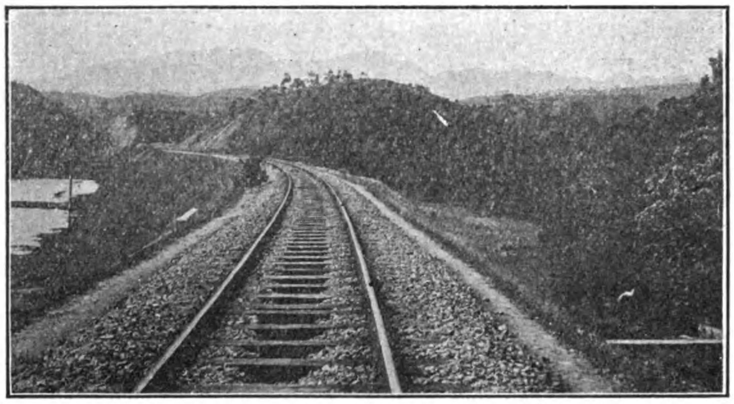


TAI SHA TAN STATION, CANTON

QUICKEST AND CHEAPEST ROUTE BETWEEN CANTON AND HONGKONG THROUGH VARIED AND BEAUTIFUL SCENERY

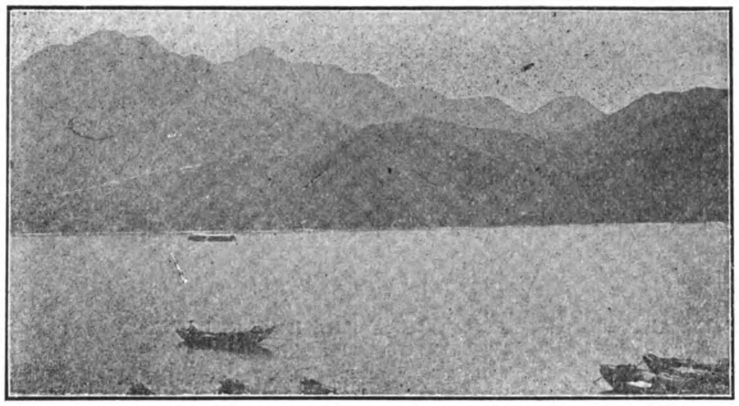


THE "EIGHT GENII RANGE" FROM TAI-PO

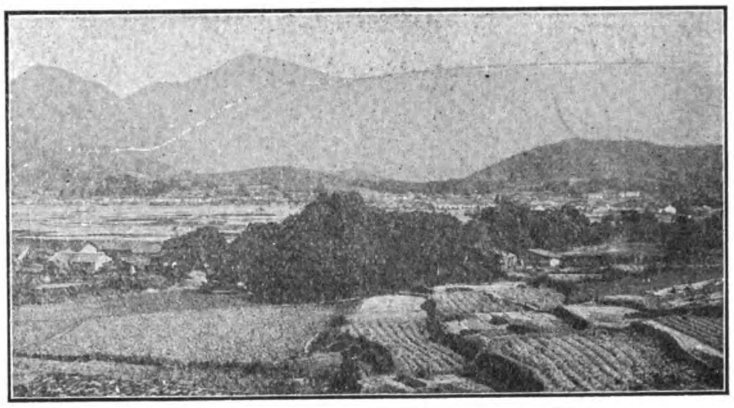


NEAR LE LOONG, CANTON-KOWLOON RAILWAY

TWO EXPRESS CORRIDOR TRAINS EACH WAY DAILY HOT TEALS AND OTHER REFRESHMENTS SERVED



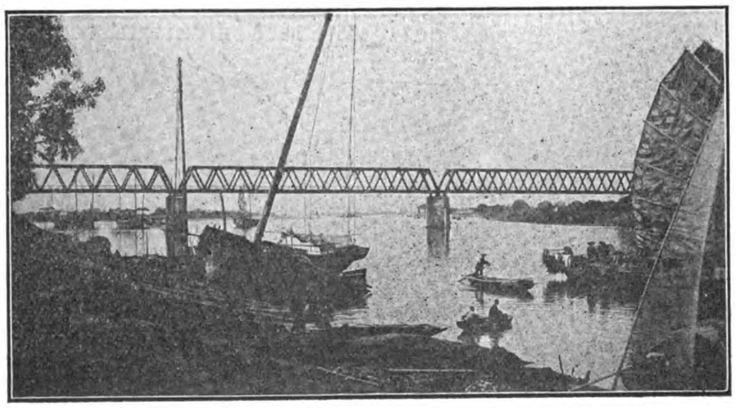
THE HUNCH-BACKS AND PYRAMID HILL



VILLAGES, CANTON-KOWLOON RAILWAY

4¼ HOURS BETWEEN UP AND DOWN TRAINS FOR BUSINESS MEN OR TOURISTS AT CANTON OR HONGKONG

THE LION'S HEAD AND STATUE ROCK, SHATIN VALLEY



EAST RIVER BRIDGE CANTON-KOWLOON RAILWAY

SUMMER SEASON 1913.

Leave Hongkong (Kowloon)	**7.15 a.m. 3.00 p.m.**	**Leave Canton (Tai Sha Tou)**	**7.00 a.m. 3.15 p.m.**
Arrive Canton (Tai Sha Tou)	**11.00 a.m. 6.41 p.m.**	**Arrive Hongkong (Kowloon)**	**10.43 a.m. 6.54 p.m.**

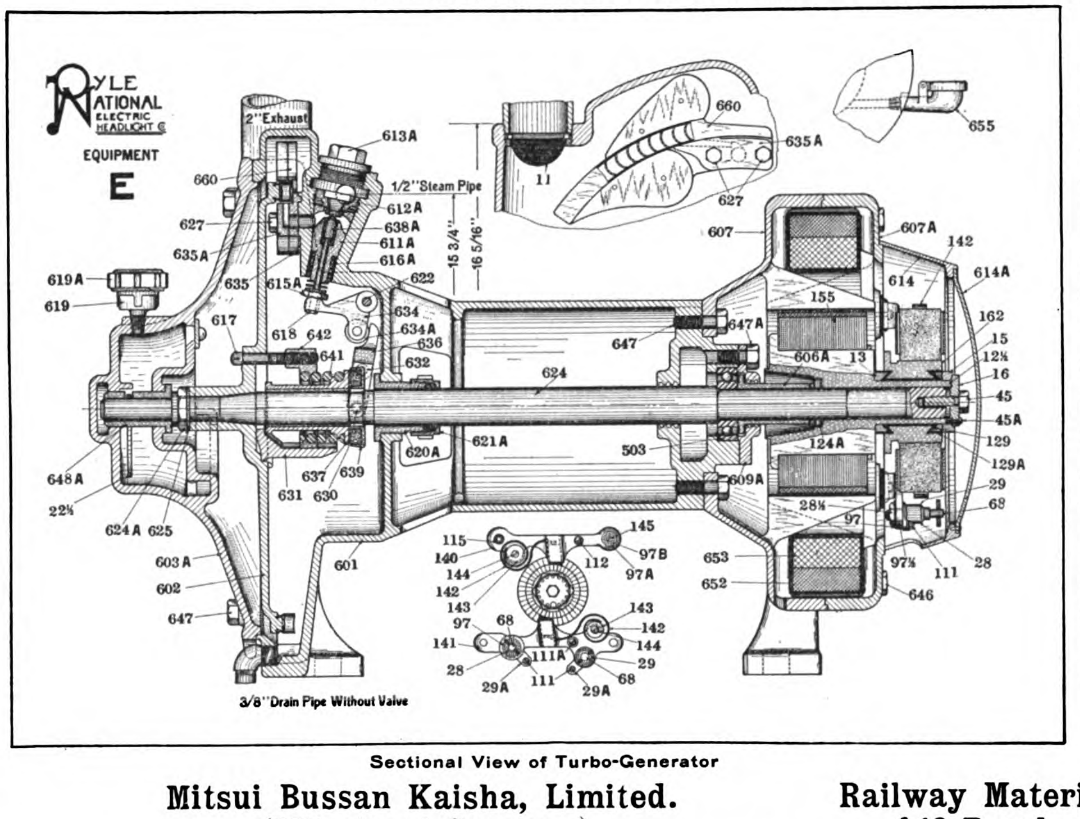
Special terms and special trains for large tourist parties. For further particulars see advertisements or apply to
The Manager (British Section) Kowloon, HONGKONG. **The Administration, (Chinese Section) CANTON.**

25,000 PYLE-NATIONAL ELECTRIC HEADLIGHTS IN SERVICE

Actual Photograph taken on the Chicago, Rock Island and Pacific R.R., with no other light but the Pyle-National Electric Headlight. The station seen is half a mile from the engine.

A Pyle-National Electric Headlight gives a Great Beam of Clear, Strong, Penetrating Light that distinctly illuminates the Track for Half a Mile Ahead of the Locomotive, enabling the Engine Driver to maintain Schedules, verify Signals and avoid Accidents.

Three Railroads are each operating more than 1,500 Pyle-National Headlights. Four Railroads more than 1,000 each. Twelve Railroads more than 500 each.



Sectional View of Turbo-Generator

The universal use of Pyle-National Electric Headlights is a guarantee of their superior value. They are giving entire satisfaction on every continent, and are easily recognized by the powerful shaft of light. The special parabolic reflector is responsible for the bright shaft of light giving a reflected illumination of over 250,000 candle-power. The arc lamp is dependable, and is absolutely unaffected by weather conditions. The motor for the Pyle-National Electric Headlight is steam turbine driven, the latter having a guaranteed steam consumption less than that of any turbine in the world in similar service.

Mitsui Bussan Kaisha, Limited.
(Mitsui and Company)
Sole Agents for China, Japan, Korea, Manchuria and Siam.

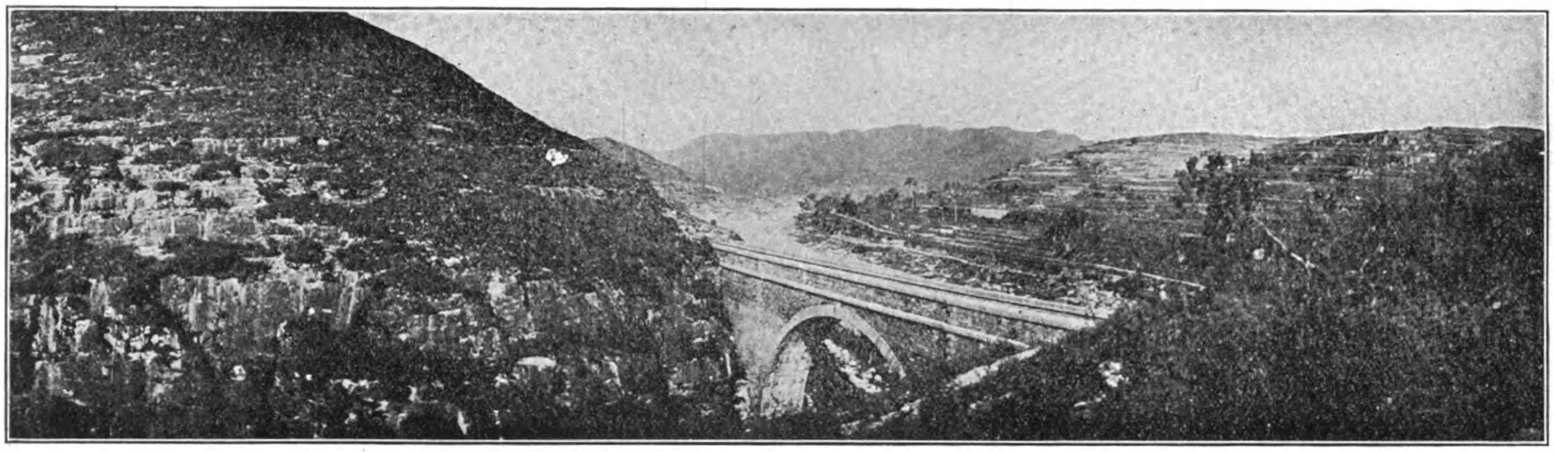
Railway Materials Export Corporation.
149 Broadway, New York, U.S.A.
Export Agents.

PYLE-NATIONAL ELECTRIC HEADLIGHT COMPANY
900 So. Michigan Ave., Chicago, Ill., U.S.A.

Chinese Government Railways

The Cheng-Tai Railway

(CHINESE GOVERNMENT SHANSI LINE—CHENGTINGFU TO TAIYUANFU)

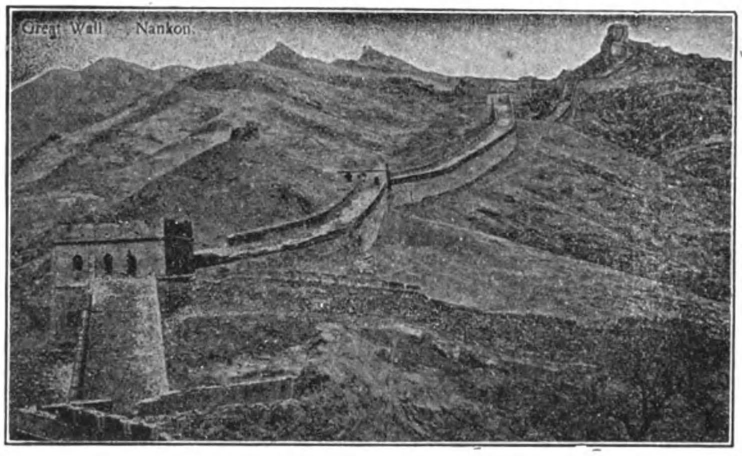


VIEWS ALONG ROUTE OF CHENG-TAI RAILWAY

The trains of this line connect with the through service of the Peking-Hankow Railway, affording Travellers the opportunity of seeing the most picturesque part of China. The line passes through a mountainous section of country, rich in Mineral Resources to the Provincial Capital of Shansi at Taiyuanfu. This interesting city is a great educational center, and famous for the fine quality of its artistic embroideries.

The Peking-Kalgan Line

"THE ROAD TO THE GREAT WALL"



This line follows the ancient caravan route and military highway from Mongolia into China by the way of the historic Nankow Pass. This pass is the Key to Peking, and Kalgan is the gate of the Country. From here the great camel caravans set out on their long journeys across Mongolia to Siberia and Central Asia. This old frontier mart, retaining its time-honored characteristics, one of the most interesting sights of the Old World, is made accessible by the new railway. The line also carries the passenger in two hours from Peking to Nankow, when the Great Wall of China and the Ming Tombs may be seen. A foreign hotel is operated by the railway authorities at Nankow, where chairs and guides may be secured for the Tombs.

Bohler Bros. & Co., Ltd.

STEEL WORKS

STYRIAN TOOL STEEL

Vienna, London, Berlin, Sheffield, Paris, Brussels, Leipsic, Dusseldorf, Munich, Frankfort a/m Prague, Budapesth, Remscheid, Moscow, St. Petersbnrg, Ekaterinburgh, Vladivostok, Tokyo, Osaka, Sydney, Moji

Extensive Stock at Shanghai of Highspeed, Tungsten, Chromium and Manganese Steels, Drill Steel, Tools, Files, Wire Ropes, Etc.

On Admiralty List—Contractors to most Governments

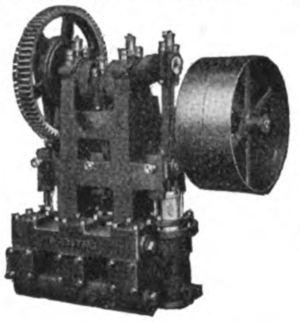
Japan Branch: International Building, Tokyo.
China Branch: 10 Kiangsi Road, Shanghai.

Your Pumping Costs Reduced One Third

DEMING POWER PUMPS

IT is a proven fact that the cost of operating is about one-third less than with direct-acting Steam pumps.

They are unequalled for general water supply, boiler feeding, brine circulating, mine pumping and the like. Any power will operate them. They are made in many different styles and sizes; capacities of from 5 gallons to 1,000 gallons per min.



ALL the world over the Deming Power Pumps are in use. Export order orders are given especial attention. Every condition and requirement is studied. Advice is tendered. Consignments thoroughly examined and carefully packed.

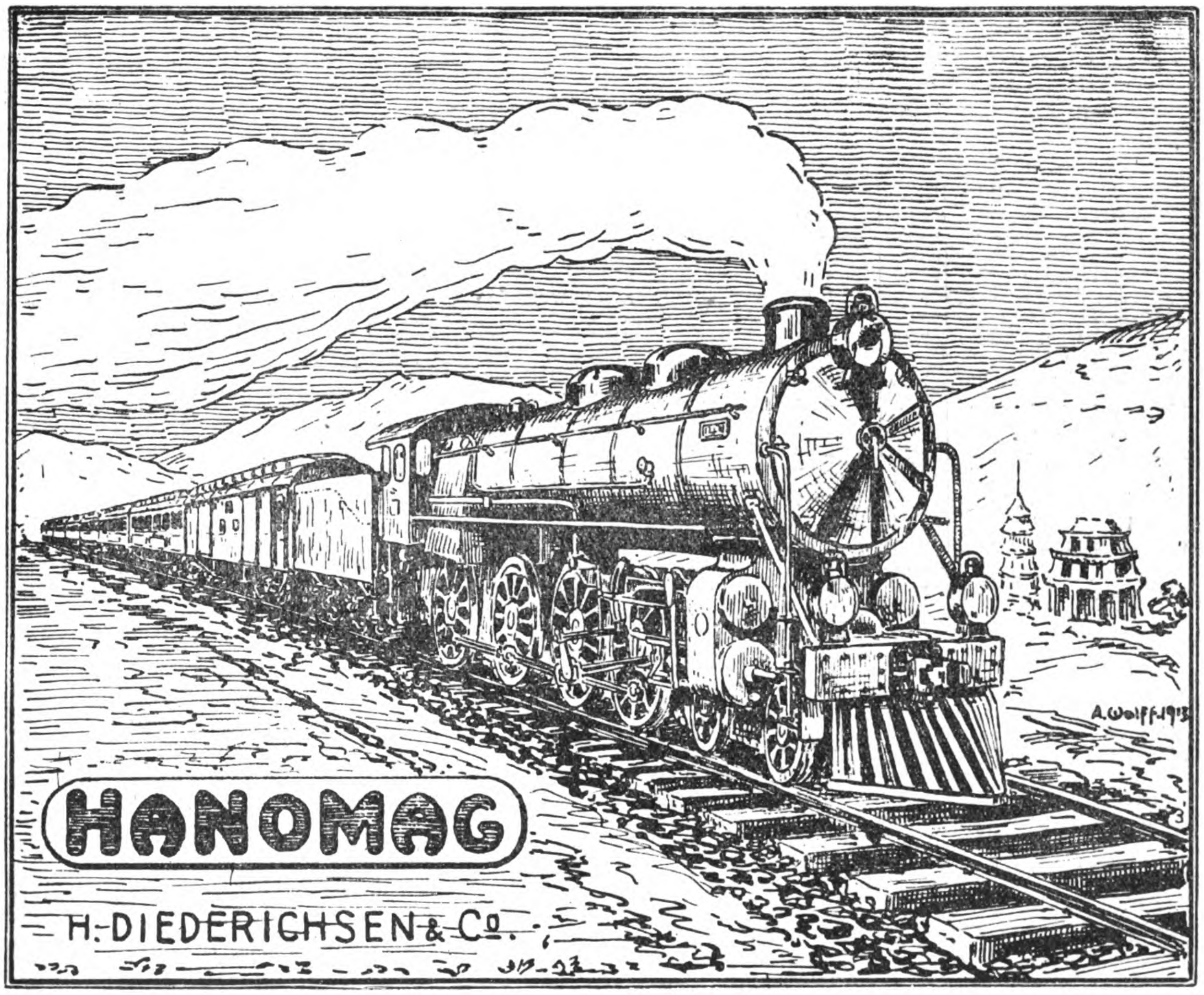
The interesting Deming Catalog is Free. Write for it, mentioning your needs.

THE DEMING COMPANY

SALEM, OHIO, U. S. A.

Manufacturers of Hand and Power Pumps

AGENTS:
American Hardware & Pumping Co., Manila, P. I.
Markt & Co. (Shanghai), Ltd., Shanghai, China.
United Engineers Co., Singapore, S. S.
Burn & Co., Ltd., Calcutta, India.



Hanover Locomotive Works

LATE GEORGE EGESTORFF

GERMANY

HANNOVER-LINDEN

General Agents

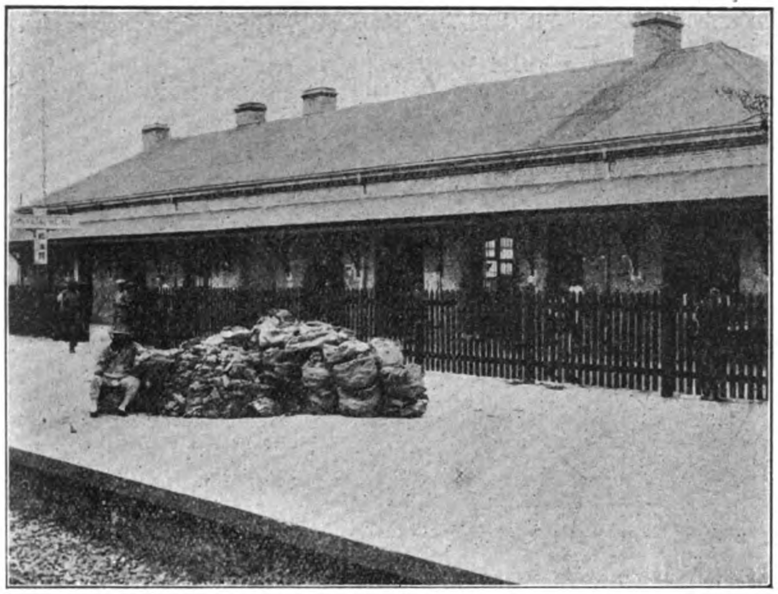
H. DIEDERICHSEN & Co.

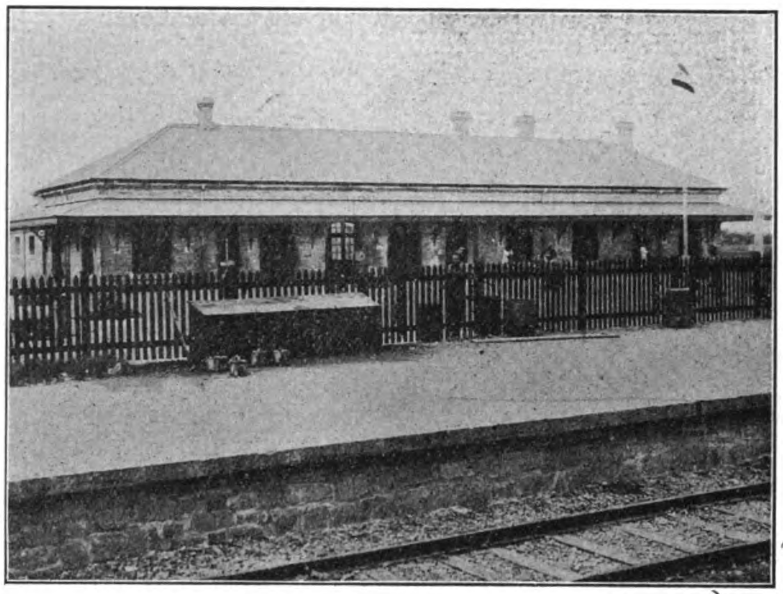
Shanghai, Hankow, Chinkiang, Chefoo, Tsingtau, Tsinanfu, Tientsin, Changsha, Peking, Canton.

CHINESE GOVERNMENT RAILWAYS

TIENTSIN-PUKOW LINE

Express Passenger Train Service





STATION AT LIU HUAI KUAN TIENTSIN-PUKOW RAILWAY. BRITISH OR SOUTHERN SECTION STATION AT PENG-PU

Notice is hereby given that through express service of first, second and third classes with dining and sleeping cars from Tientsin to Pukow has been inaugurated on December 4th, 1912, and until further notice. These trains will leave Pukow on Mondays, and Tientsin, on Saturdays, stopping only at the principal stations en route.

UP TRAIN TIME TABLE DOWN TRAIN

Stations	Mon-days only	Daily Through Mail Service	Stations	Satur-days only	Daily Through Mail Service
Pukow dep.	9.10	9.50	Tientsin East dep.	7.30	9.40
Hsuchowfu „	7.02	7.54	Tientsin Cen. arr.	7.40	9.50
Tsinanfu „	3.12	6,30	Tientsin Cen. dep.	7.55	10.10
Techow „	5.37	9.15	Techow „	1.27	4.52
Tientsin Cen. arr.	10.35	3.07	Tsinanfu „	4.09	8.01
Tientsin Cen. dep.	10.45	3.27	Hsuchowfu „	12.40	7.16
Tientsin East arr.	10.55	3.37	Pukow arr.	9.40	4.30

Departure			*Arrival*		
Monday	**Pukow**	**9.50 P.M.**	**Tuesday**	**Tientsin**	**10.55 A.M.**
Saturday	**Tientsin**	**7.30 P.M.**	**Sunday**	**Pukow**	**9.04 P.M.**

EXPRESS FARE TABLES

Class	PUKOW-HSUCHOWFU	HSUCHOWFU-TSINANFU	TSINANFU-TIENTSIN
1st class	$13.90	$13.60	$14.60
2nd class	$9.30	$9.05	$9.70
3rd class	$4.65	$4.50	$4.90

LUGGAGE ALLOWANCE

1st class, 120 catties; 2nd class, 90 catties; 3rd class, 60 catties.

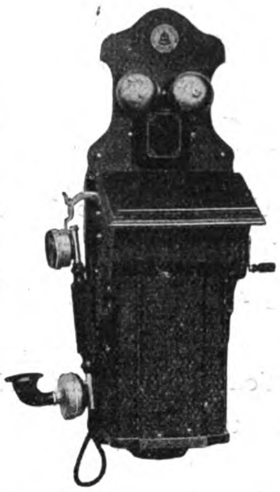
Excess luggage is charged at one (1) cent per picul per mile, minimum charge as for 50 catties.

Only first class passengers are entitled to book sleeping berths, at $5.00 per berth.

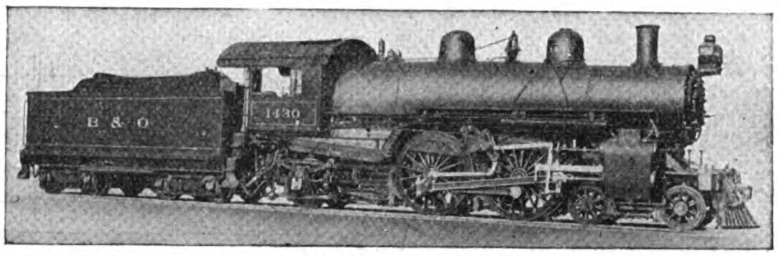
The Railway ferry steam-launch, lying at the jetty above the Japanese Hulk, will carry passengers across the river forty minutes before the trains leave. Passengers may book their tickets at the office on the ferry jetty.

The through mail, and the mixed trains running between Pukow-Pengpu, Pengpu-Hsuchowfu, Hsuchowfu-Tsinanfu, and Tsinanfu-Tientsin will continue as before. For time refer to the Time Table.

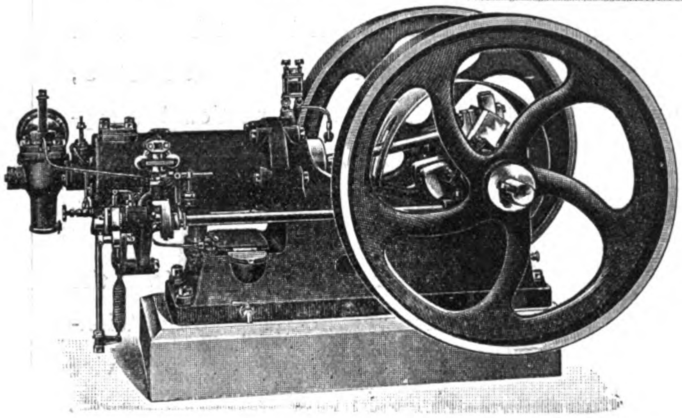
For further particulars, etc., apply to the Traffic Department at Tientsin or Branch Office, Nanking.

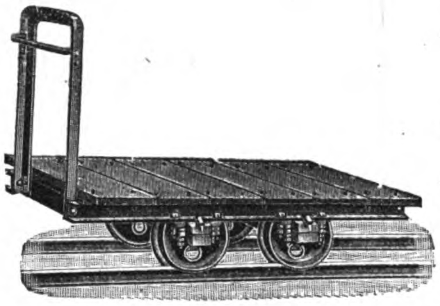


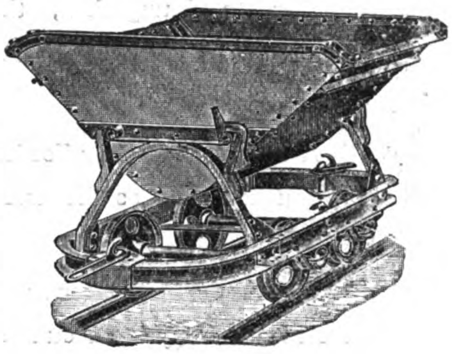
WESTERN ELECTRIC EQUIPMENT



BALDWIN LOCOMOTIVES







ARNHOLD, KARBERG & CO.

ENGINEERING AND ELECTRICAL DEPARTMENTS

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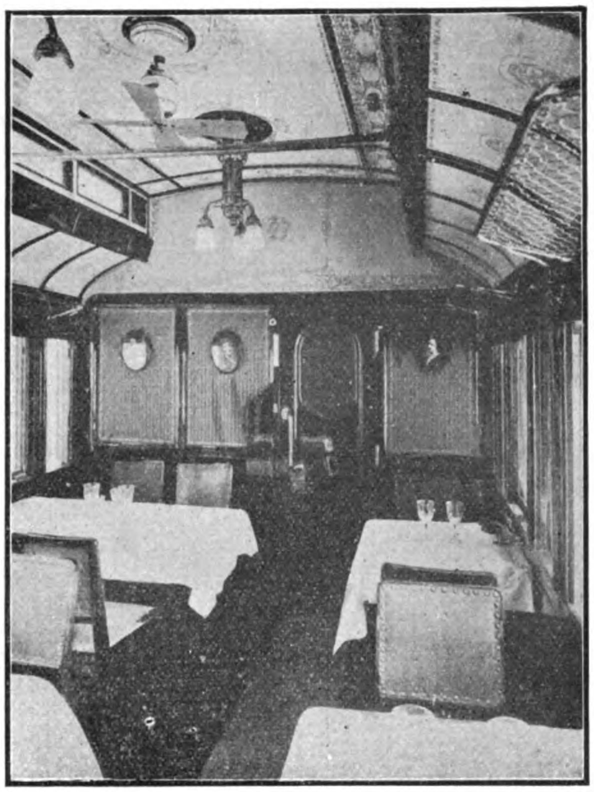

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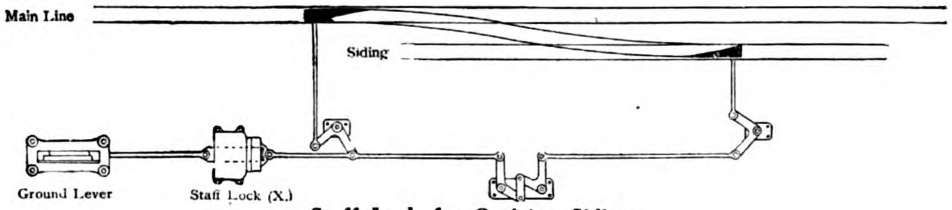

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When a train is required to enter or leave an outlying siding the staff is placed in the top slide of the lock, which is then pushed in.
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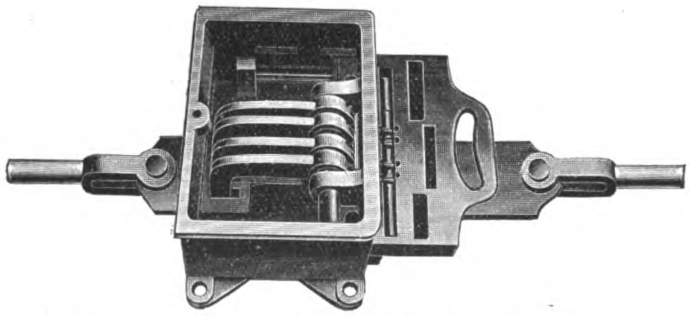
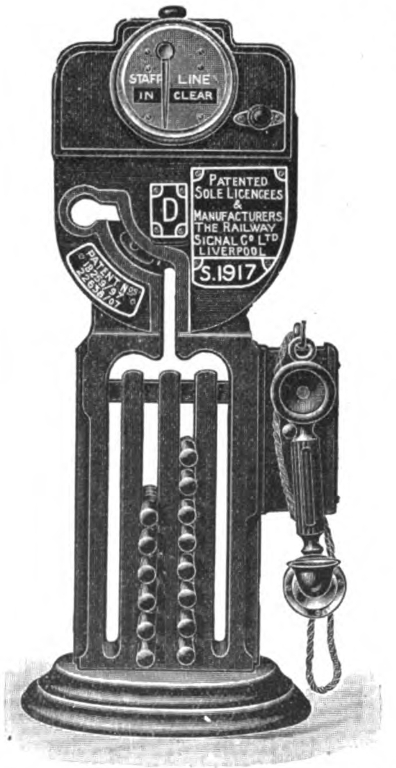
When the points are set for the siding the train staff is securely locked in the box.



Staff Lock (X) with cover removed, for Outlying Sidings.



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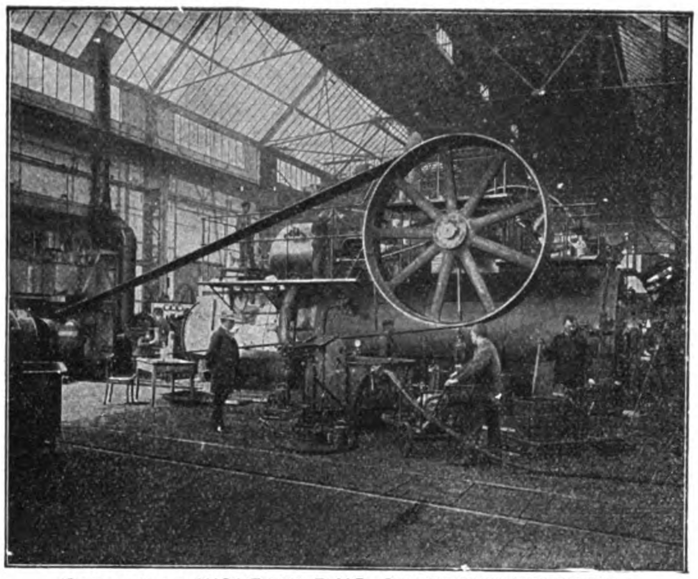

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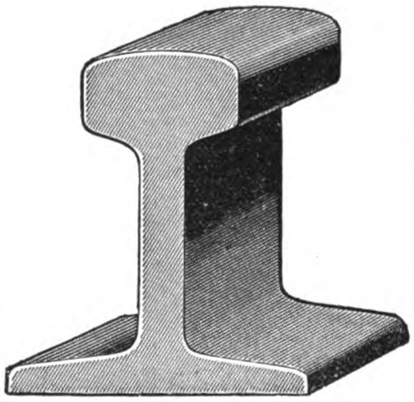

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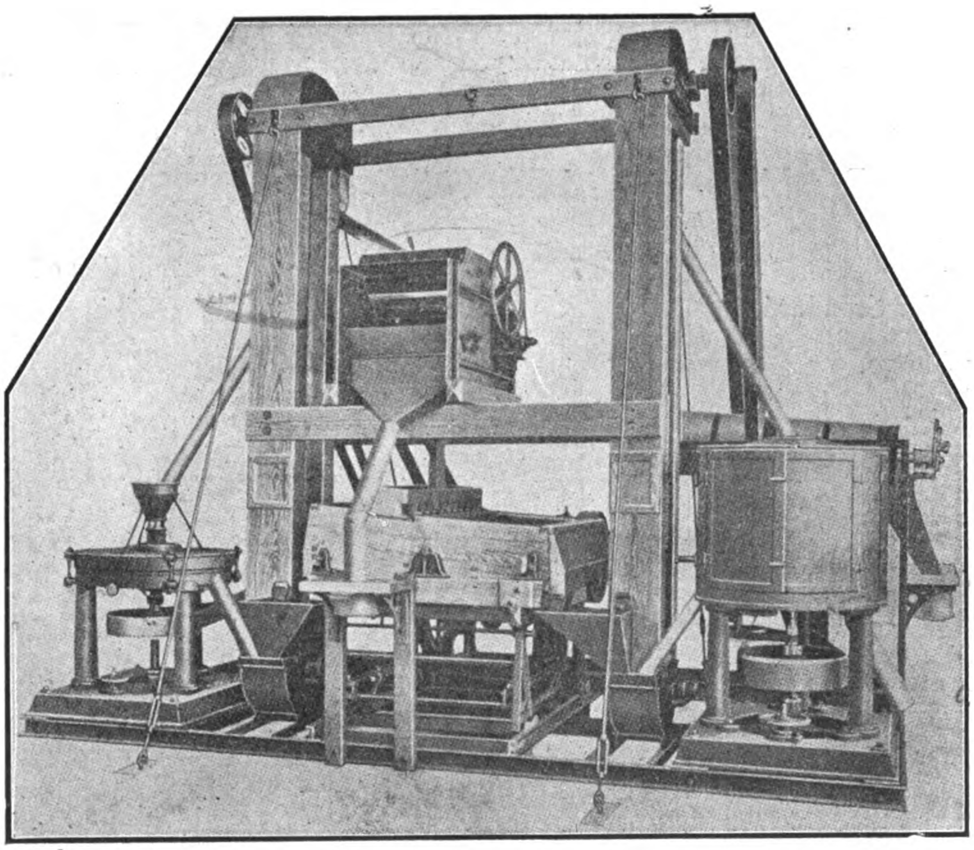

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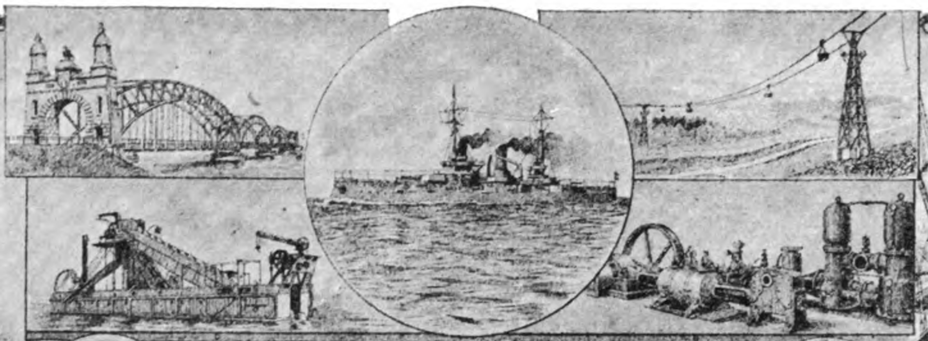

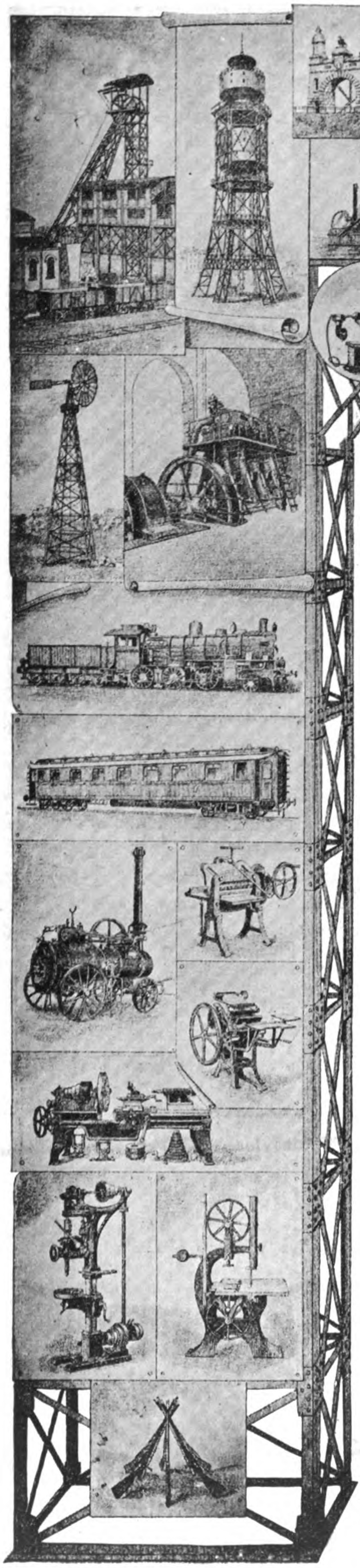

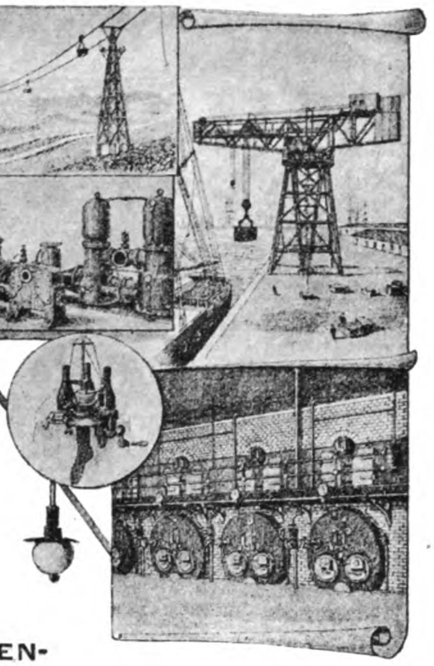

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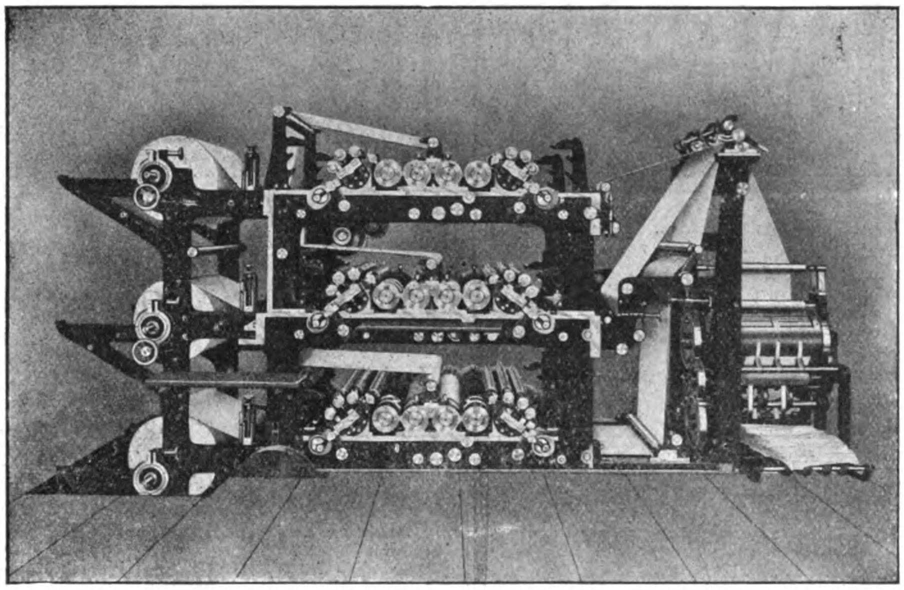

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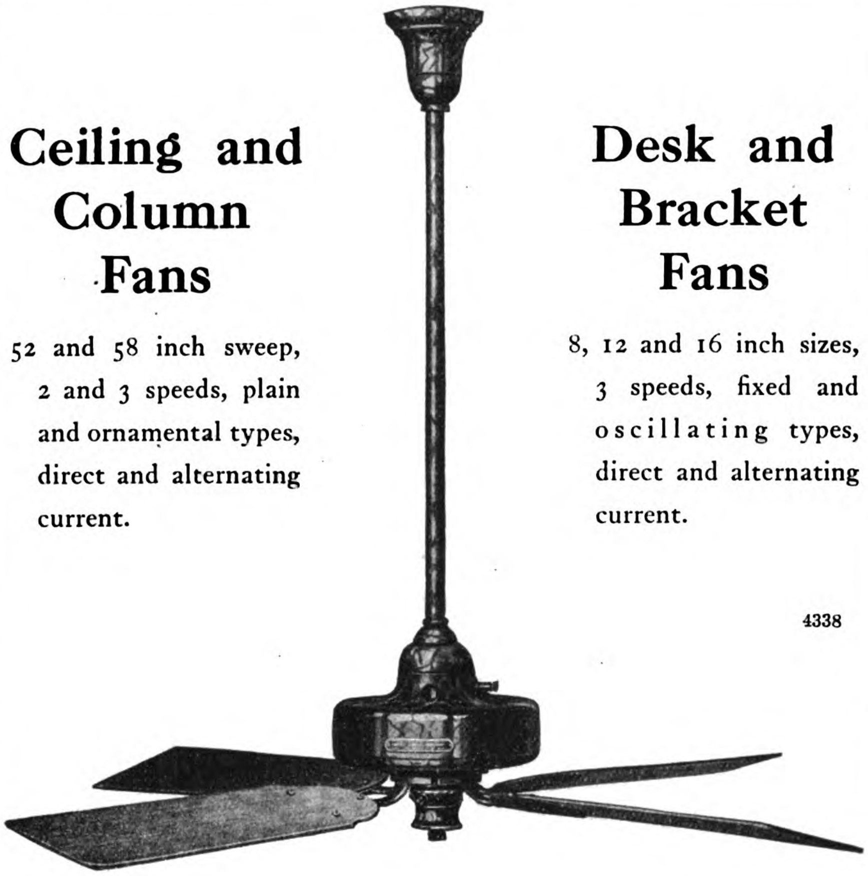

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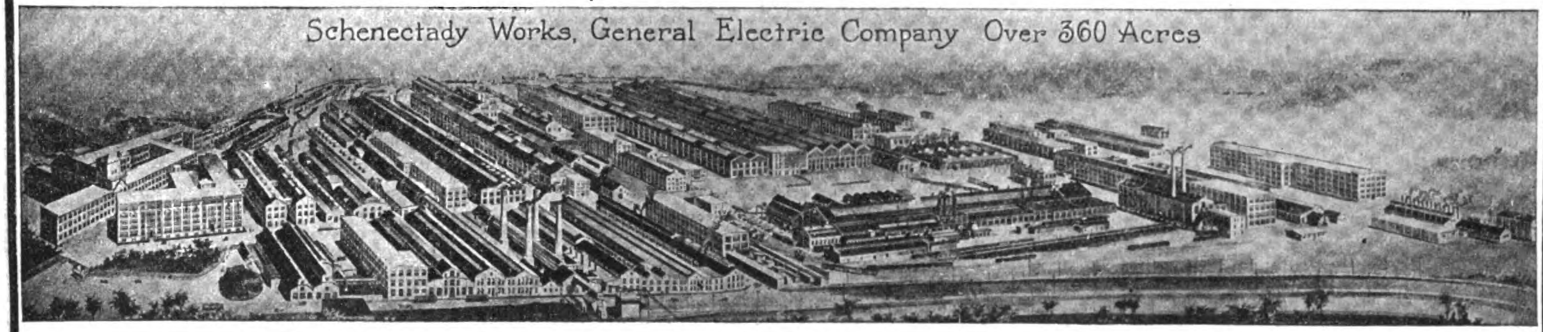

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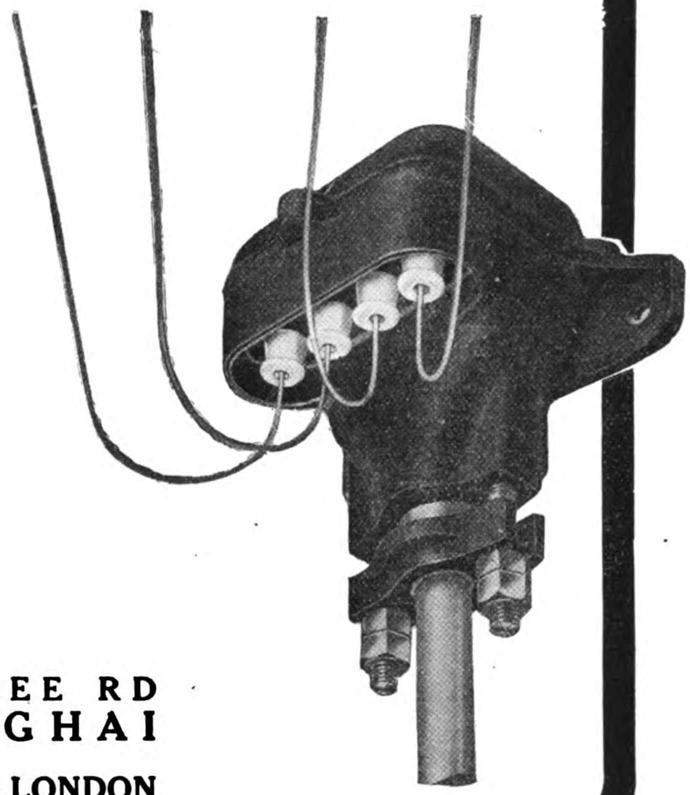

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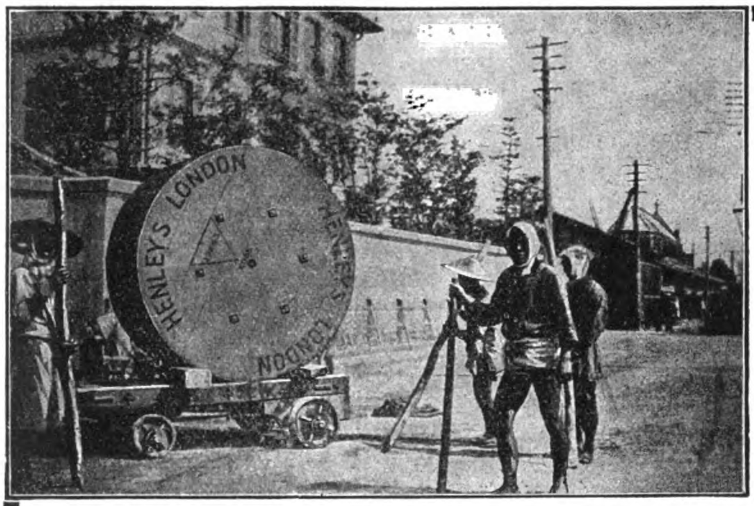

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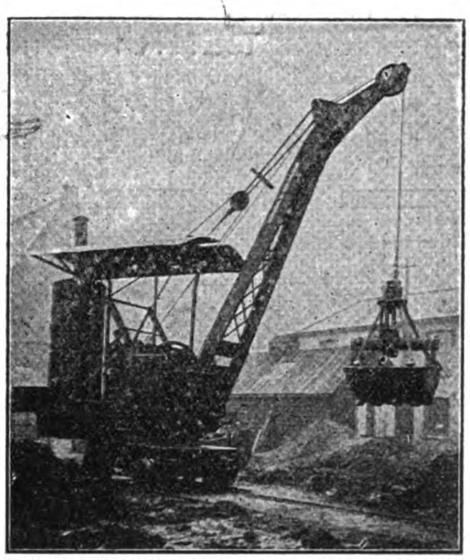
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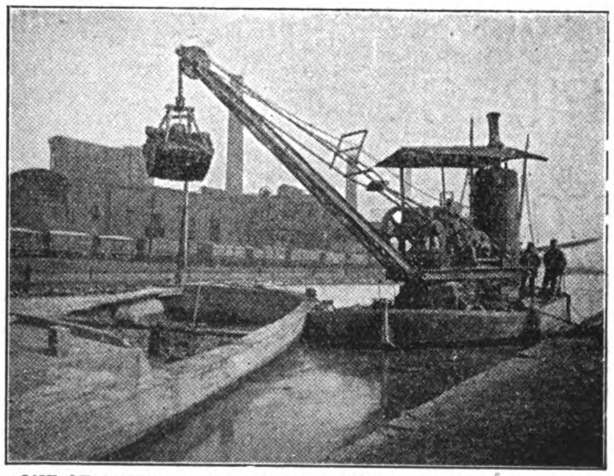
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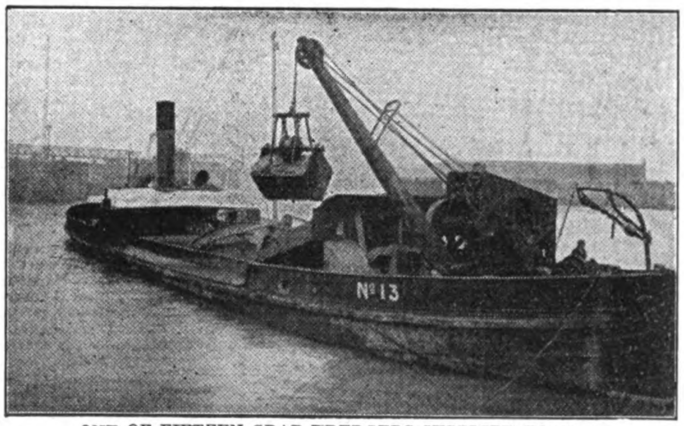

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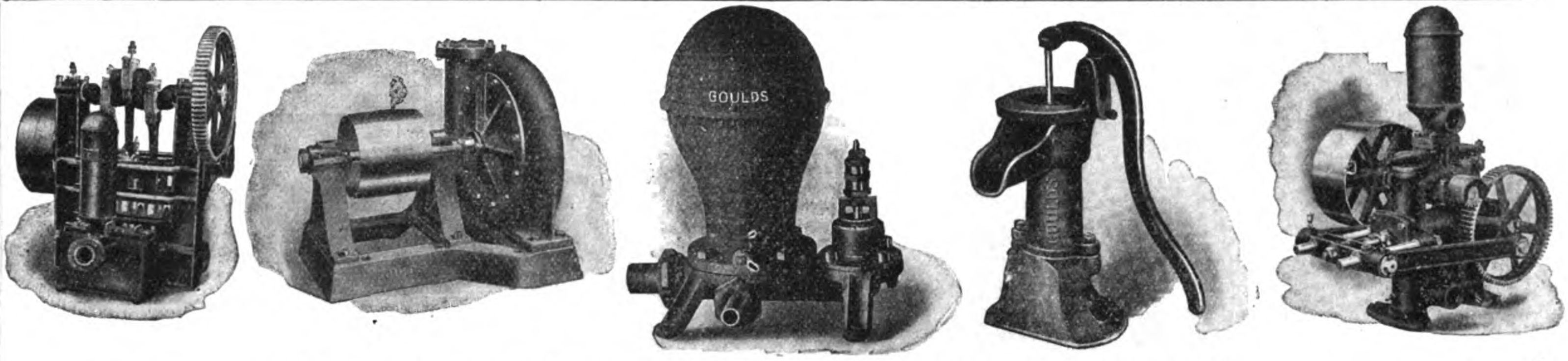

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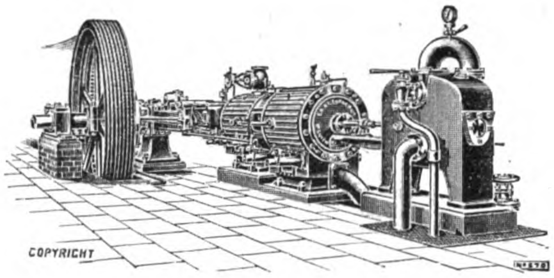

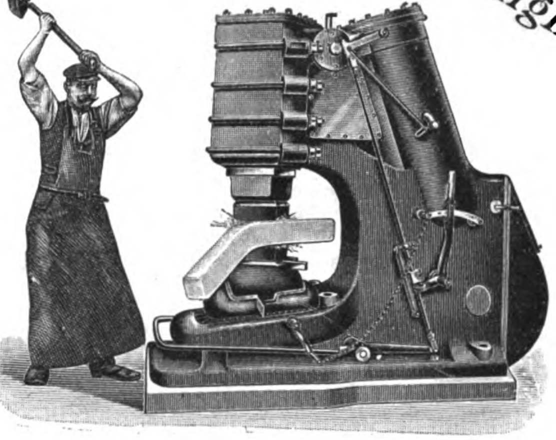

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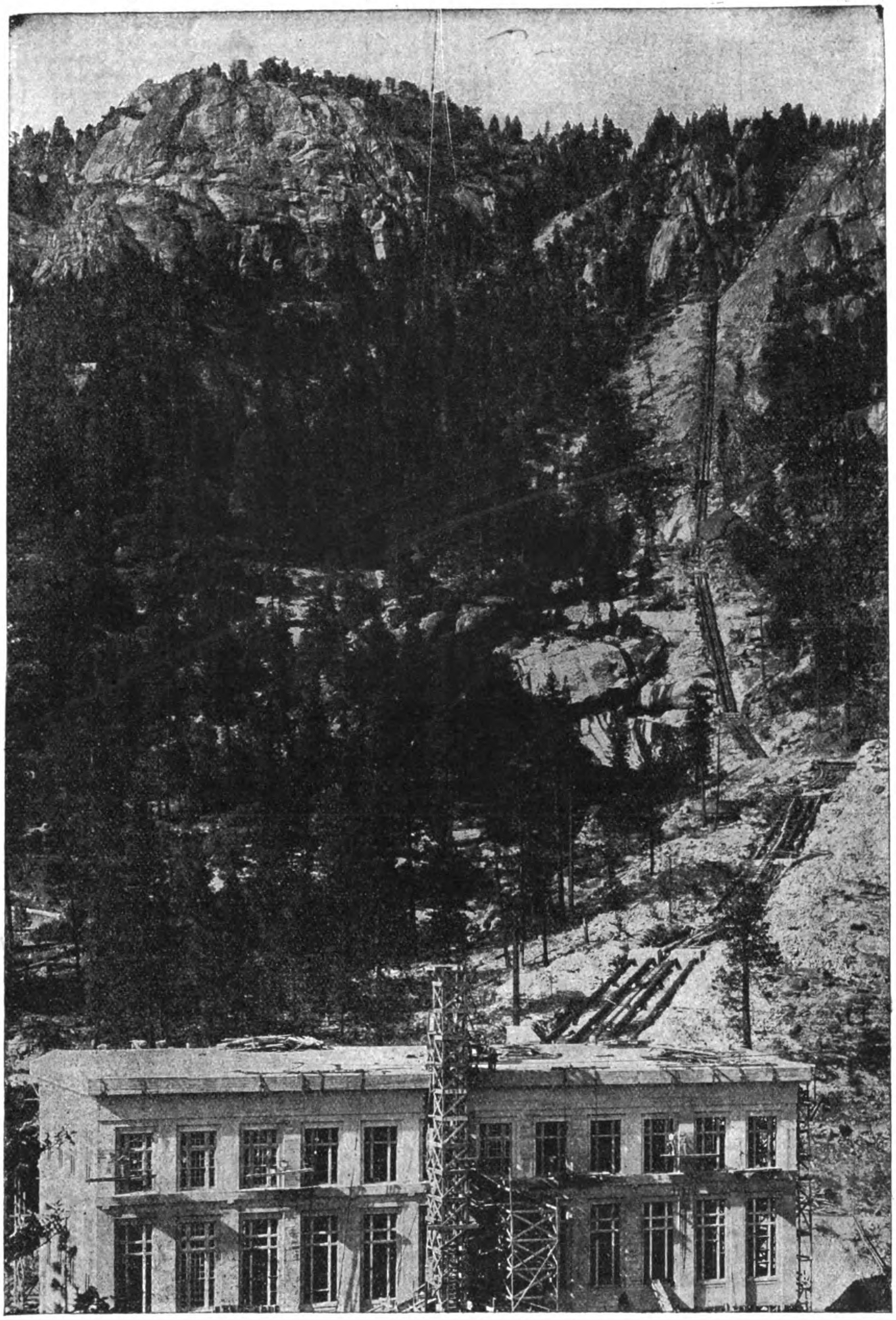

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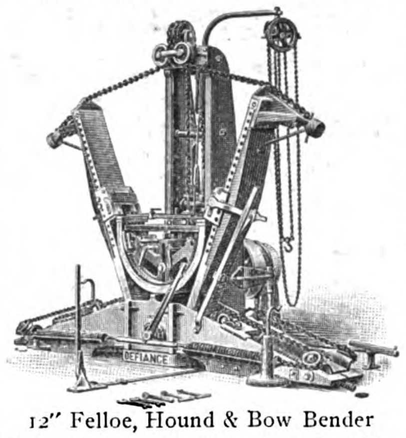

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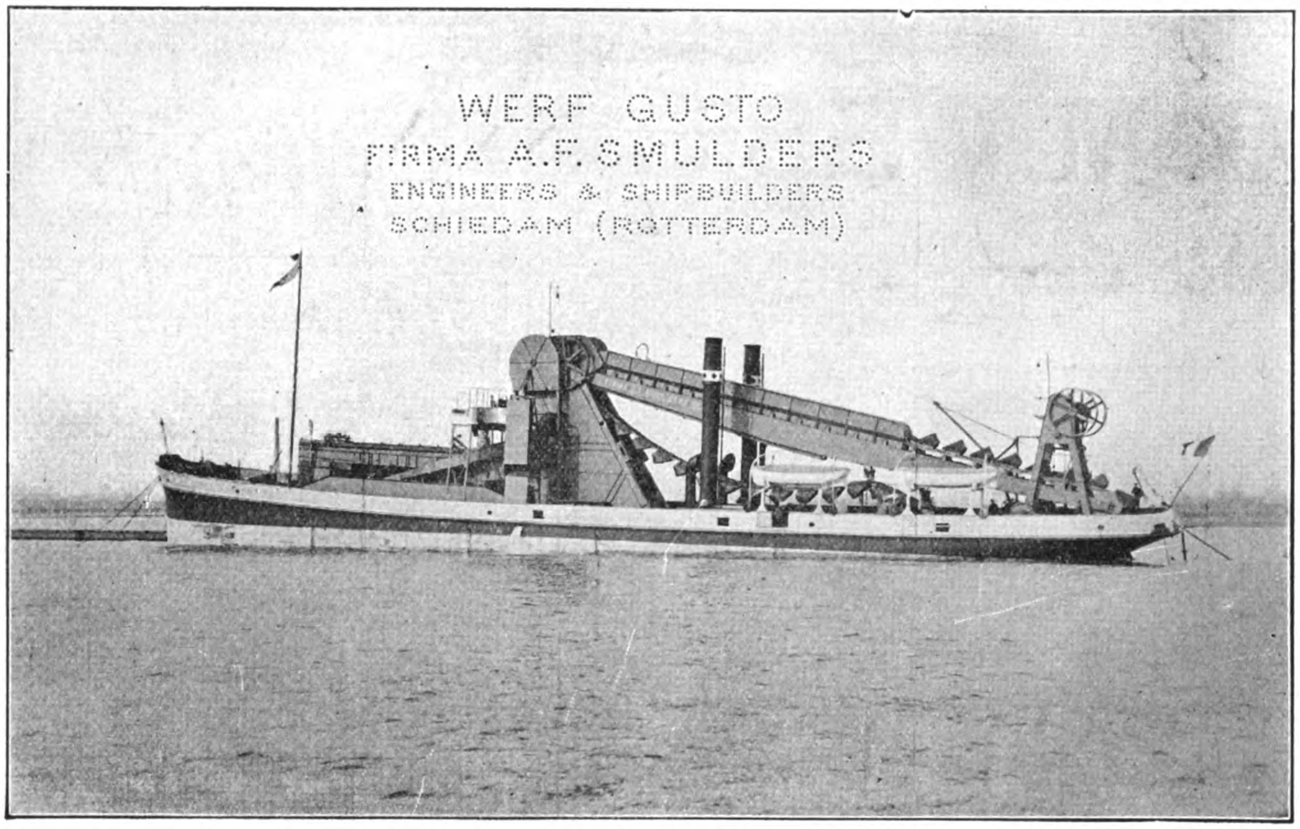

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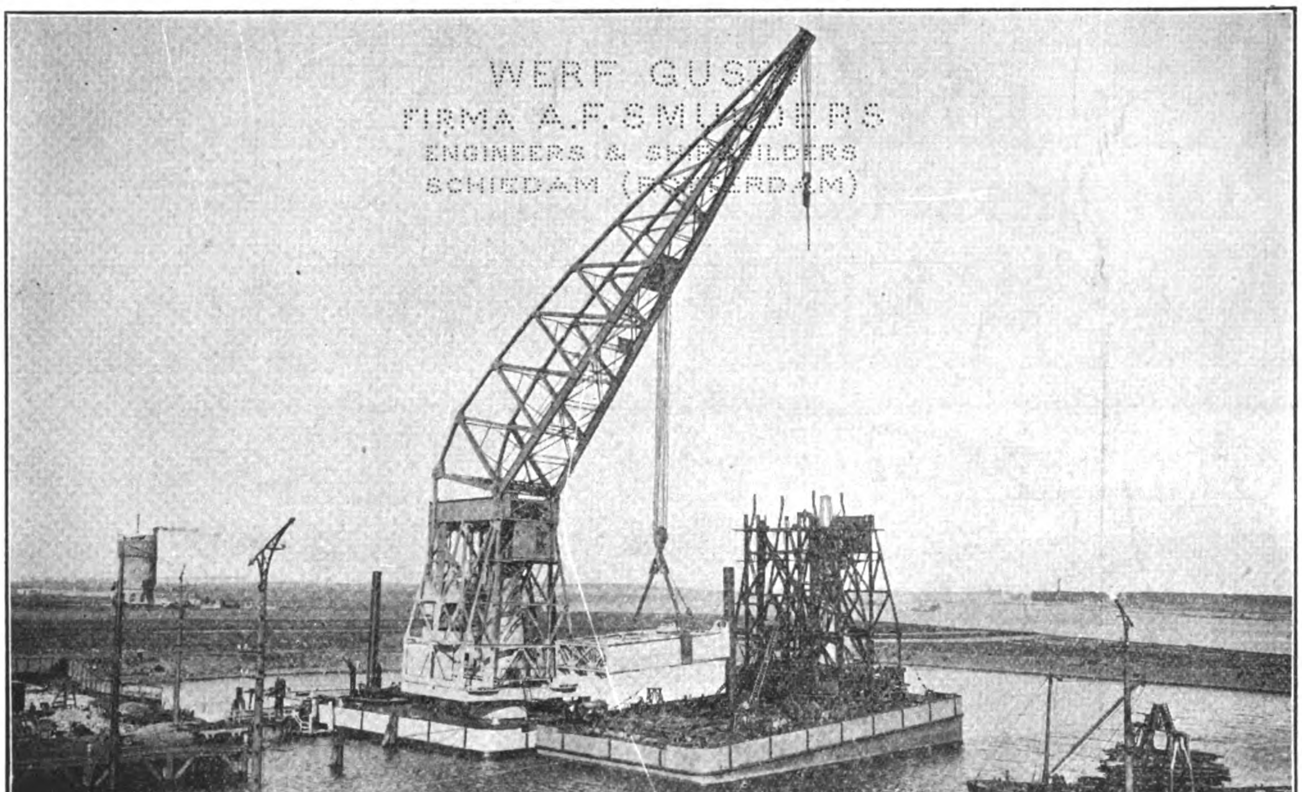

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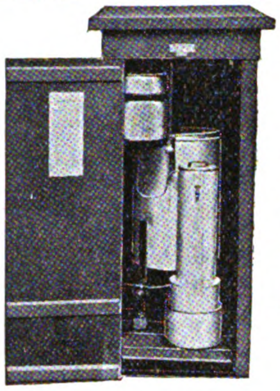

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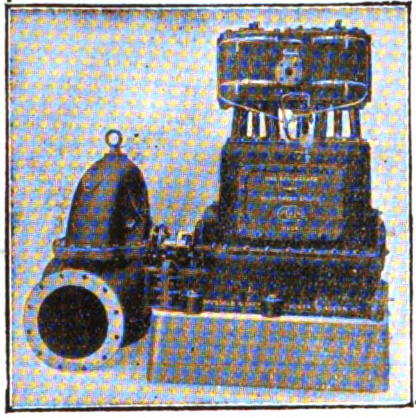

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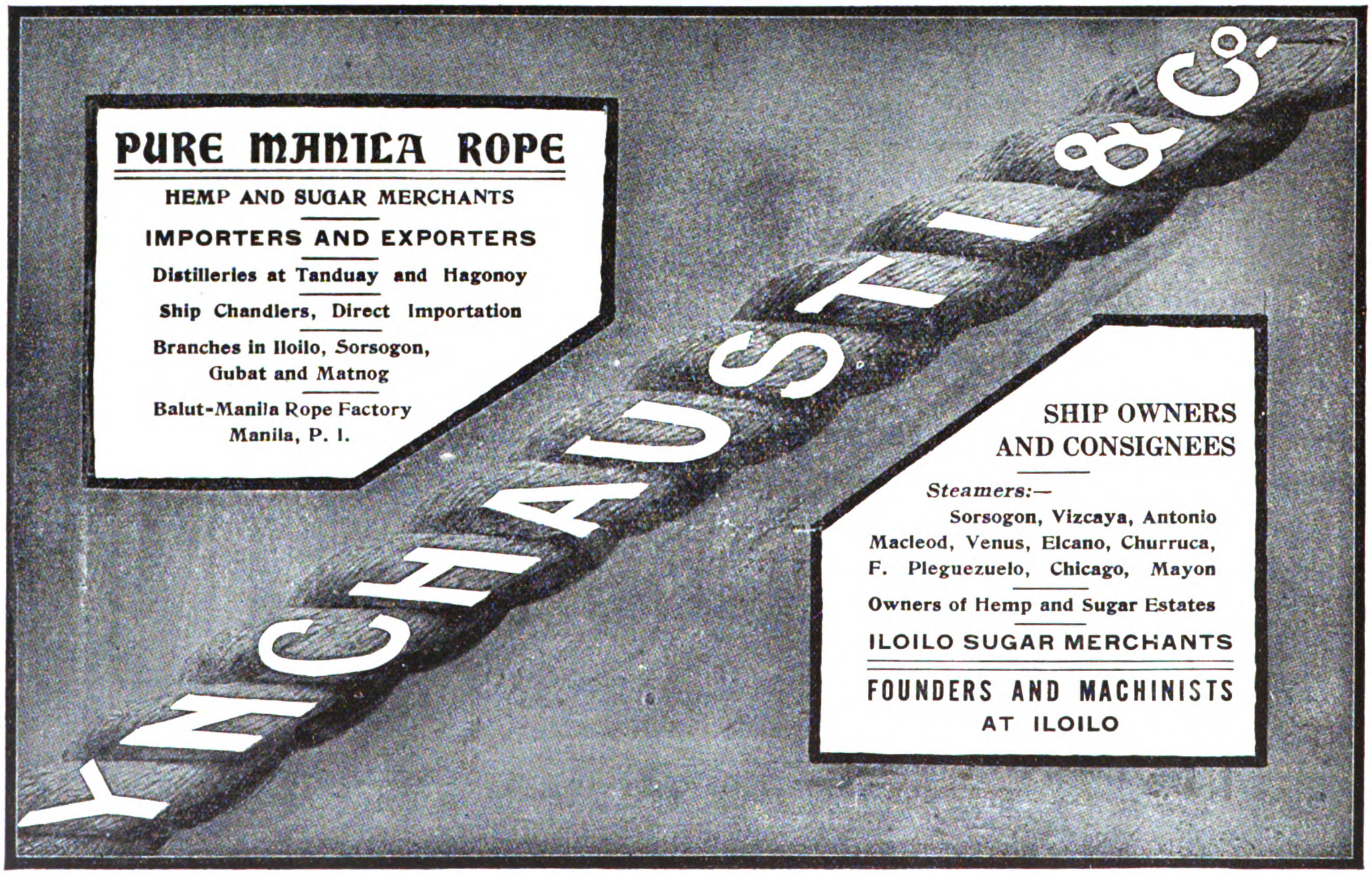

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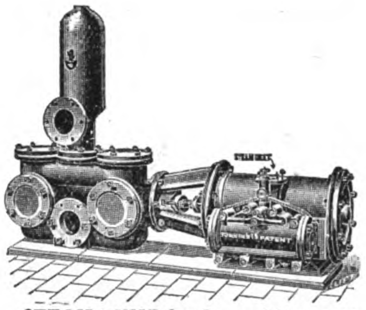

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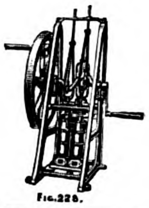
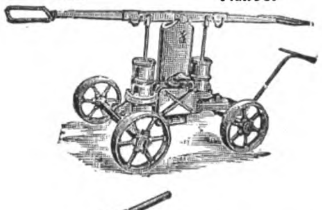


Fig.228.

Fig.160.



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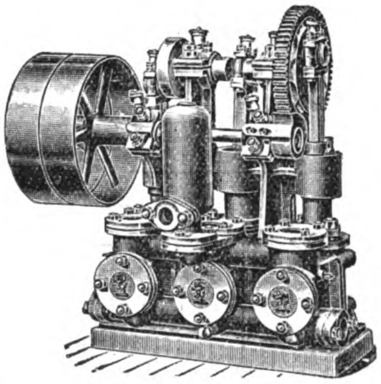

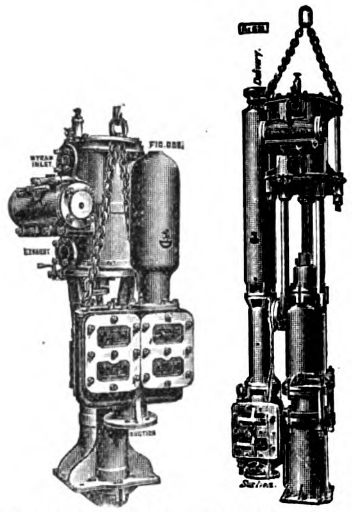

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Fig.191.

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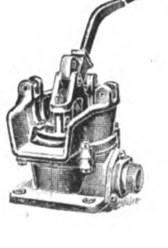

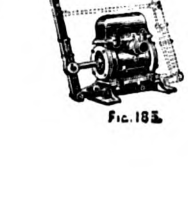

Fig.183.

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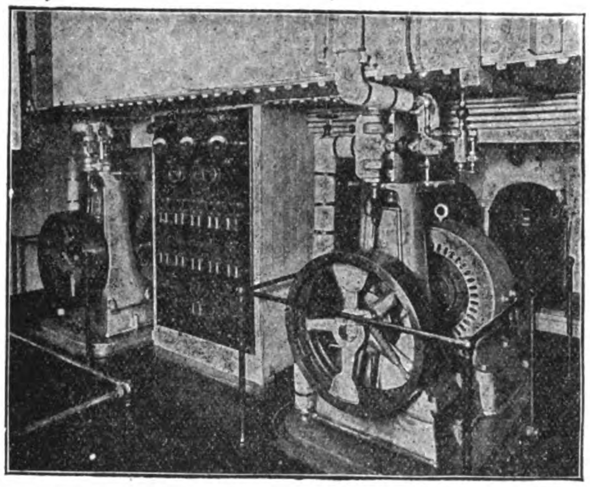

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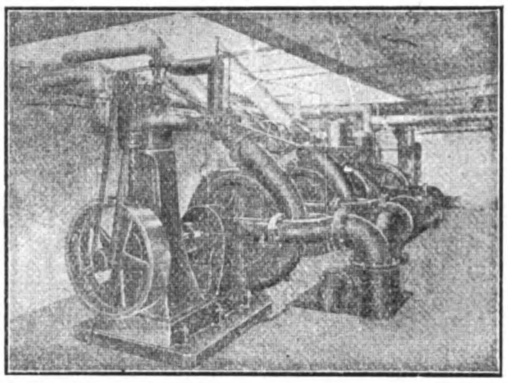

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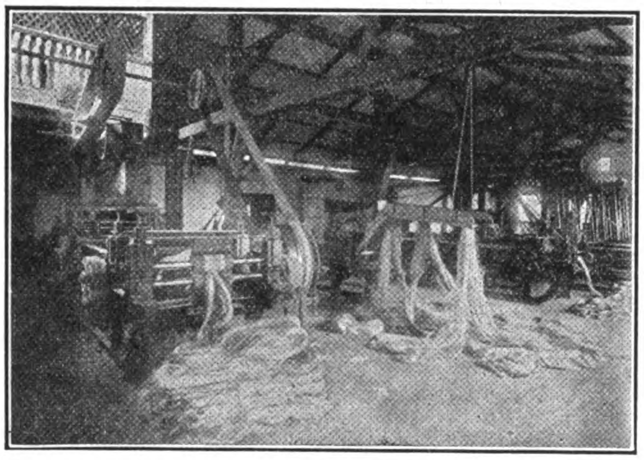

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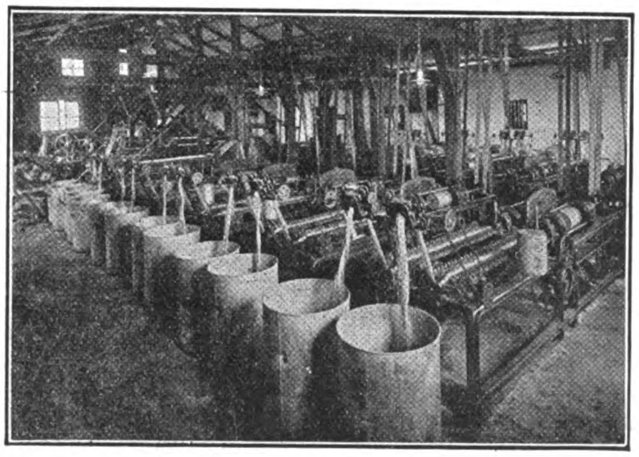

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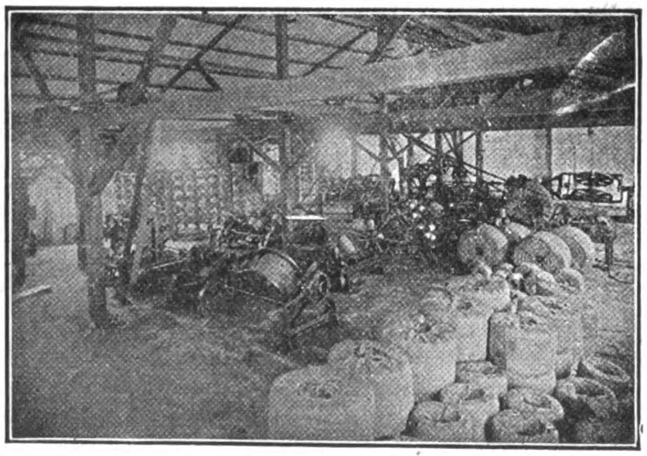

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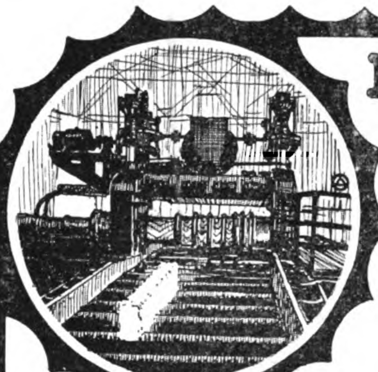

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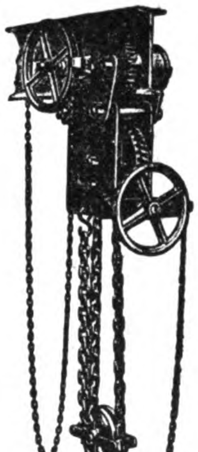

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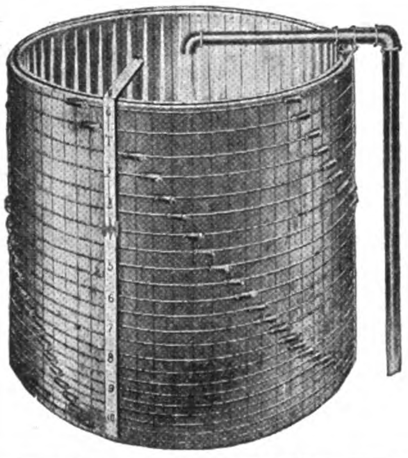

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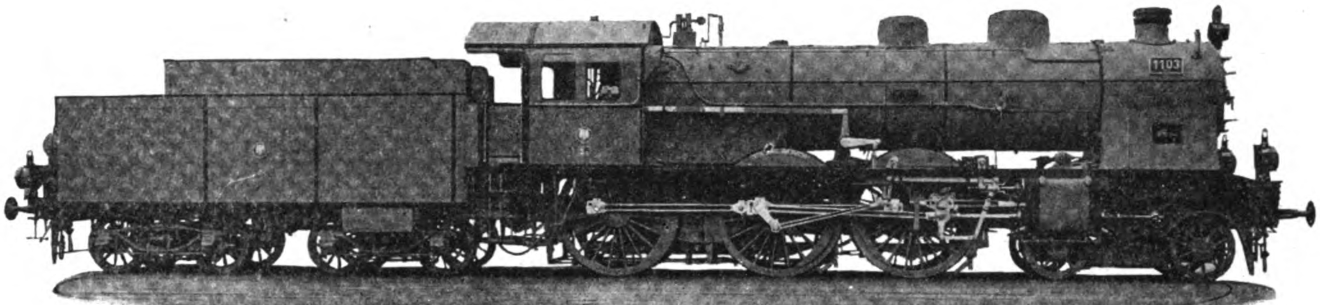

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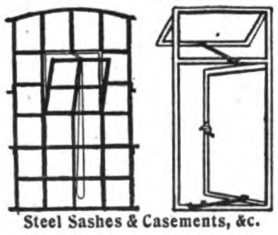

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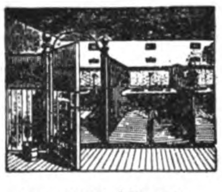

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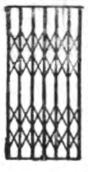

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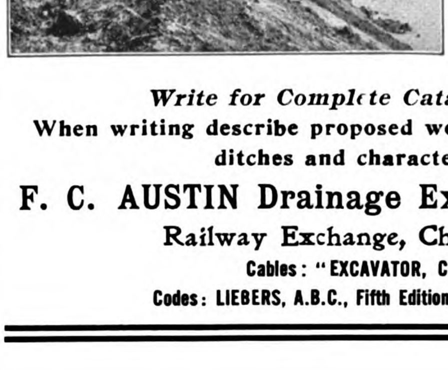

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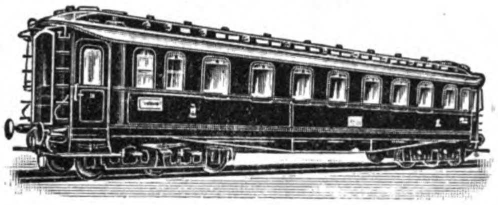

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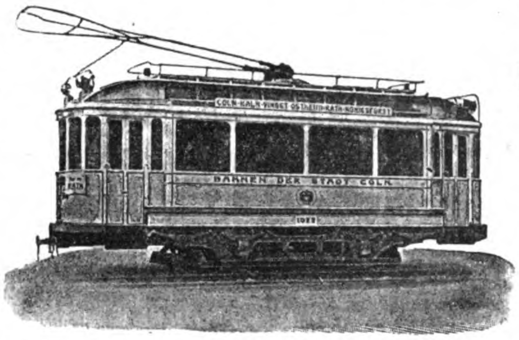

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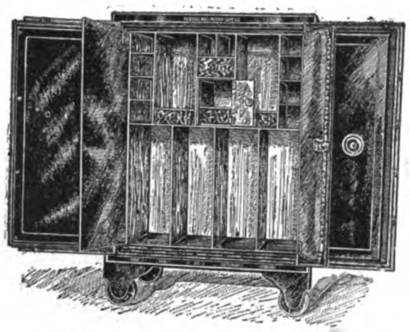

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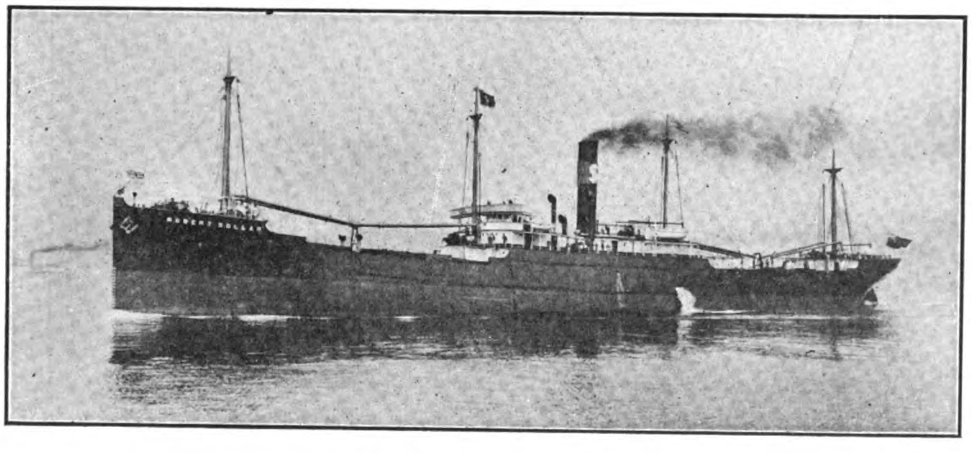

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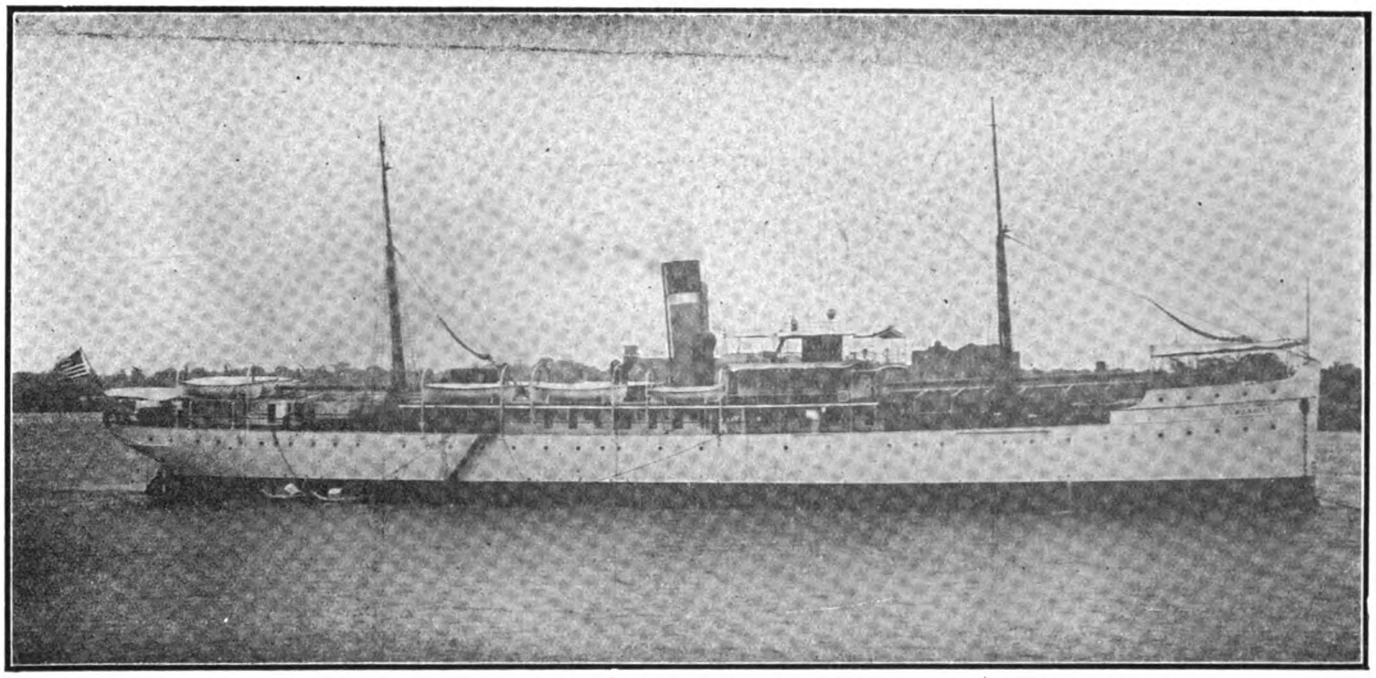

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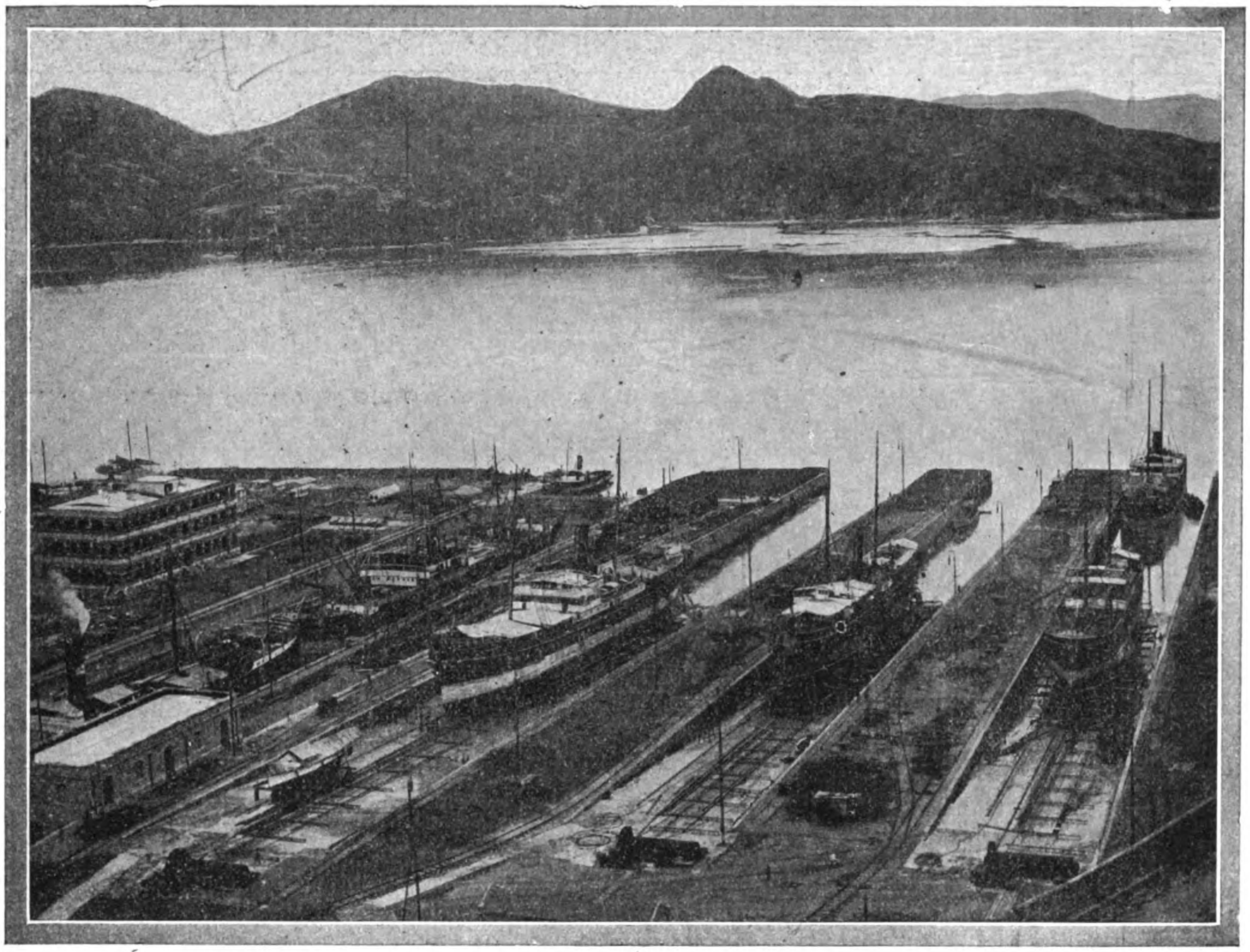

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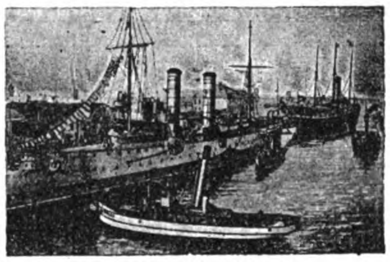

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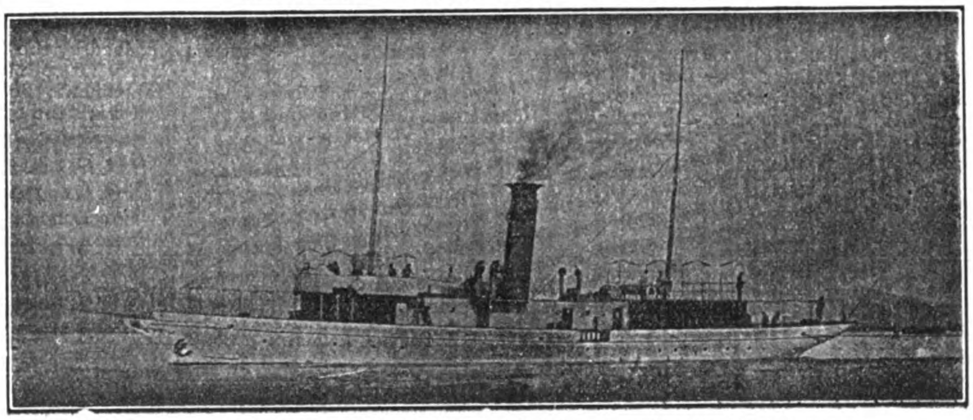

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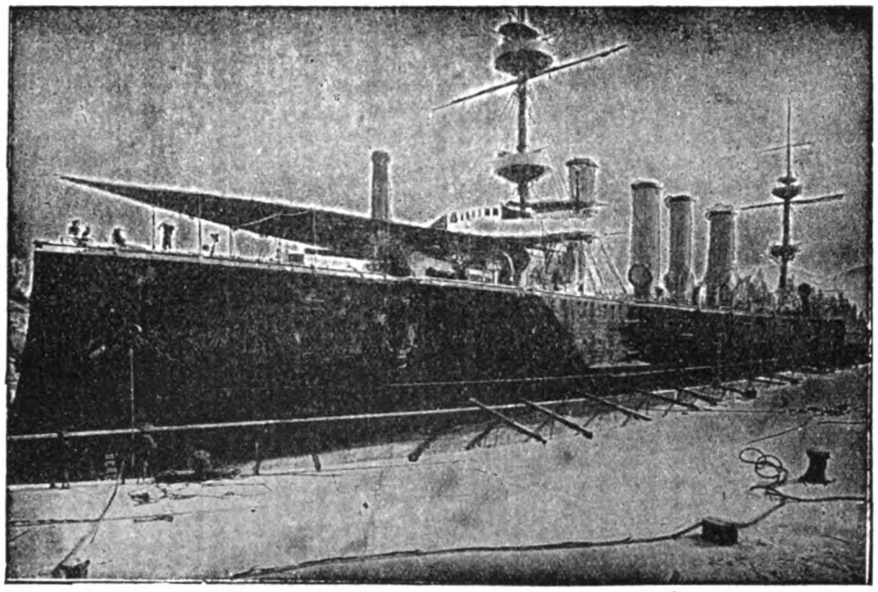

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No. 1 Dock, Kowloon	700	86 ft. top / 70 ft. bottom	30′	7′ 6″	3
No. 2 Dock, Kowloon	371	74′	18′ 6″	7′ 6″	——
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Patent Slip, No. 1, Kowloon	240	60′	14′	7′ 6″	——
Patent Slip, No. 2, Kowloon	220	60′	12′	7′ 6″	——
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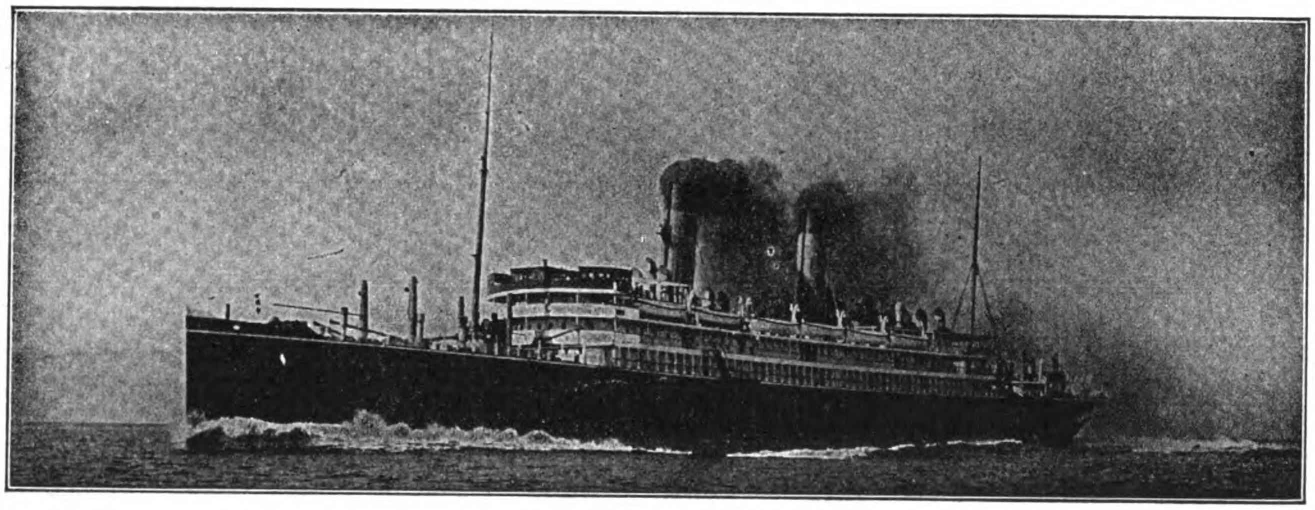

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Width of Entrance on top	88	„	Width of Entrance on top	66	„	Width of Entrance, top	99½	„
„ „ „ „ Bottom	77	„	„ „ „ „ Bottom	53	„	„ „ „ Bottom	88½	„
Water on Blocks at Spring Tide	23½	„	Water on Blocks at Spring Tide	22	„	Water on Blocks at Spring Tide	34½	„

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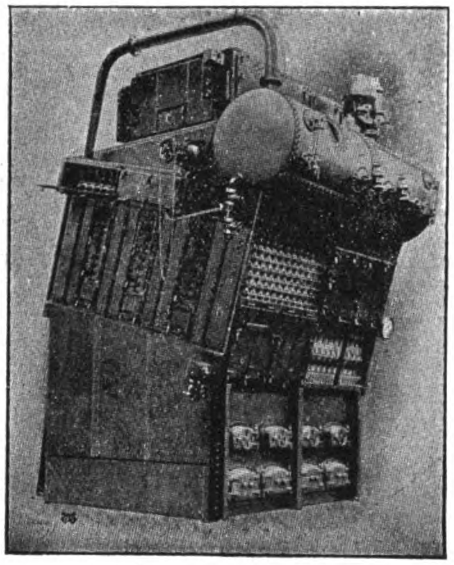

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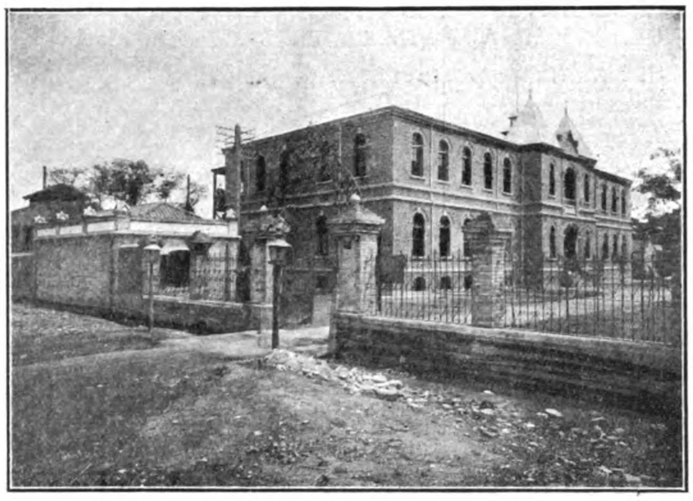

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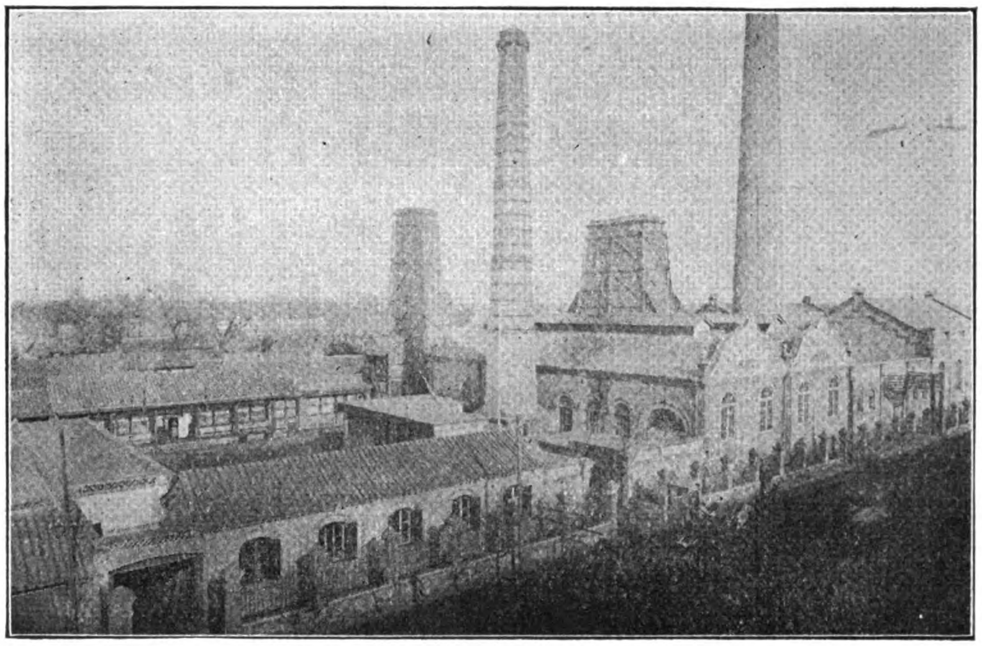

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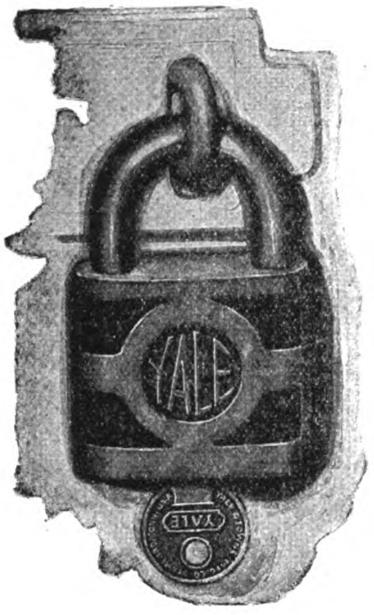

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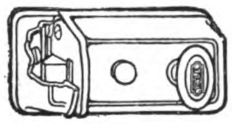

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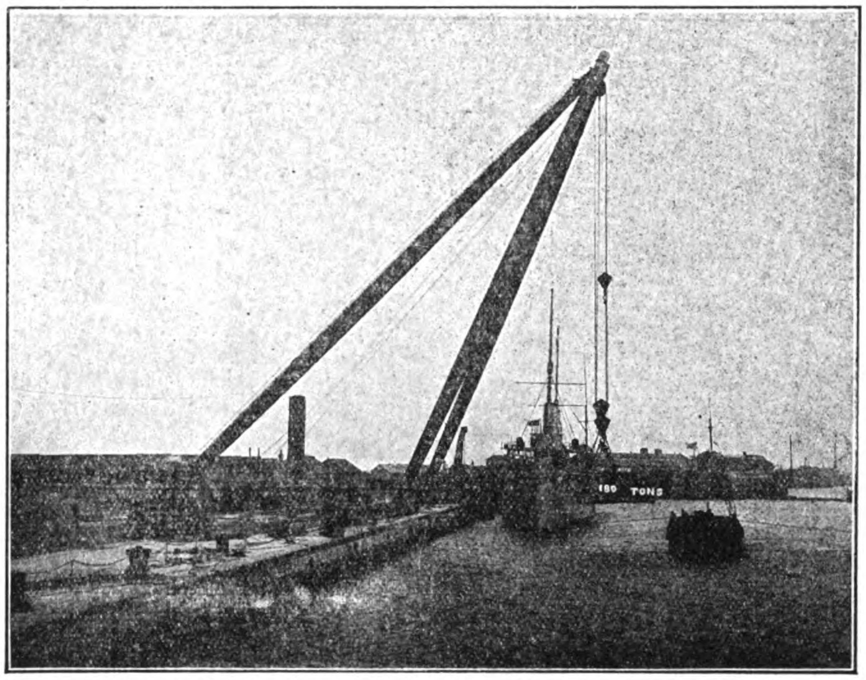

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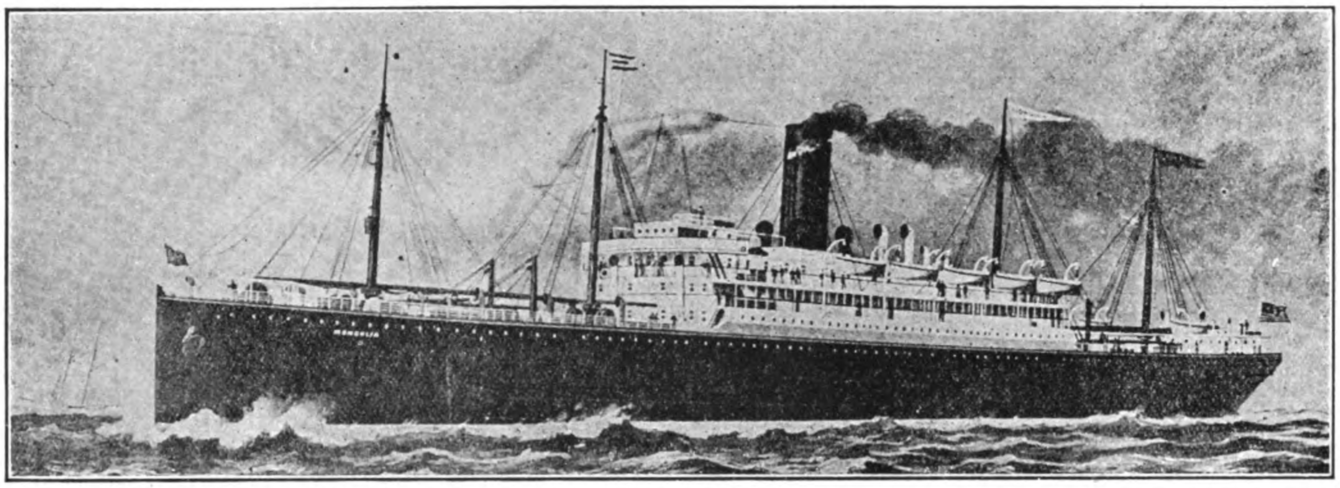

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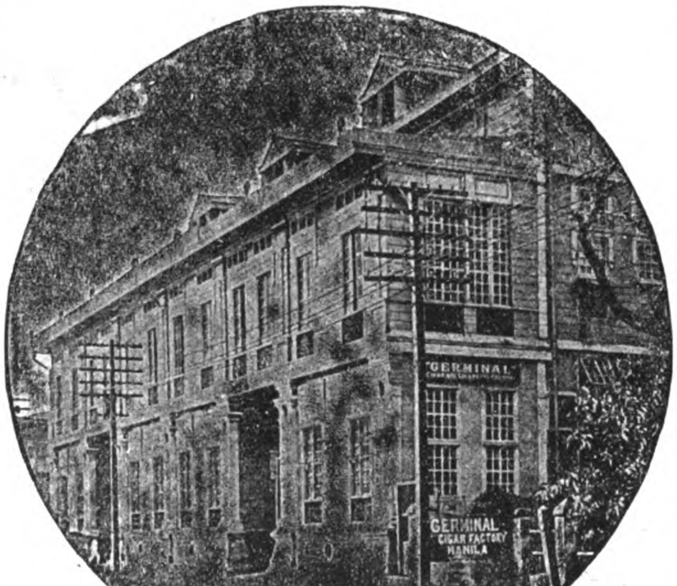

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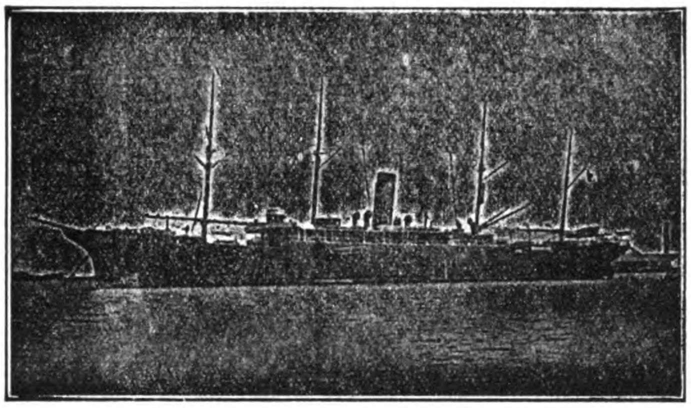

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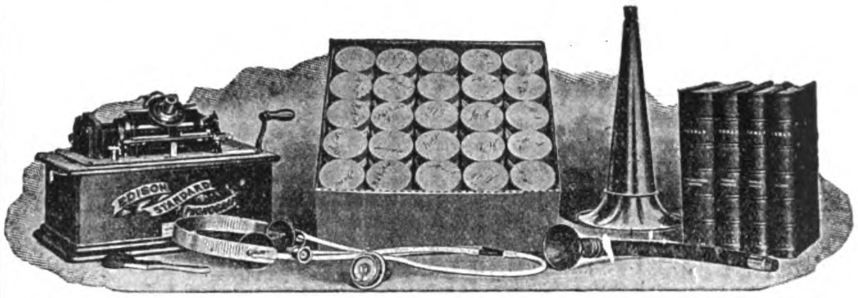

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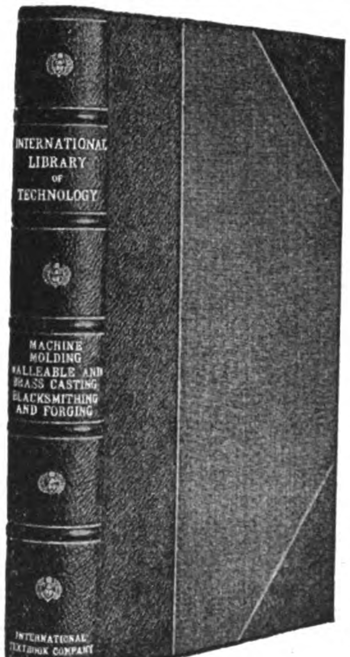

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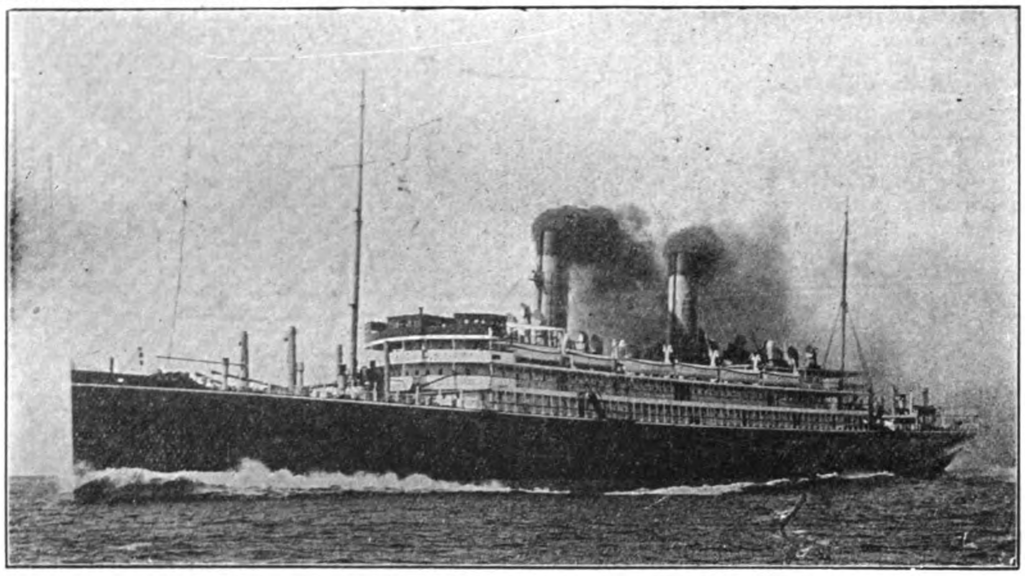

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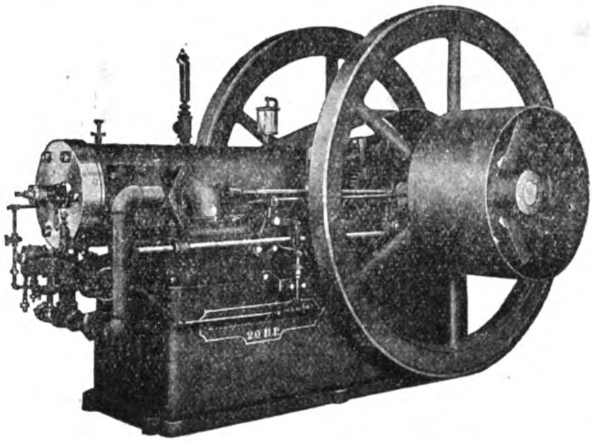

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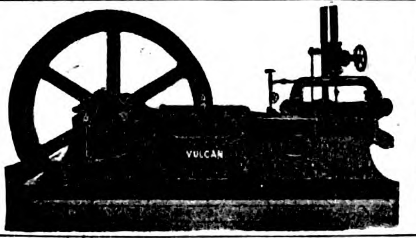

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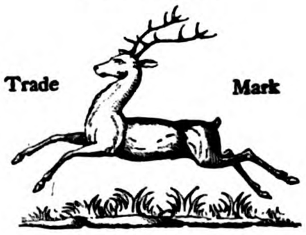
Trade  Mark

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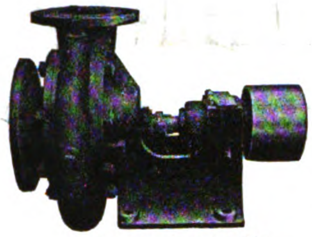

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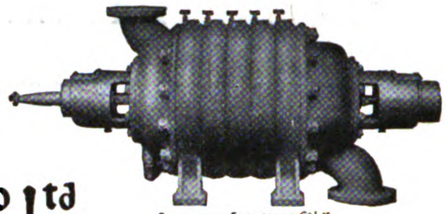

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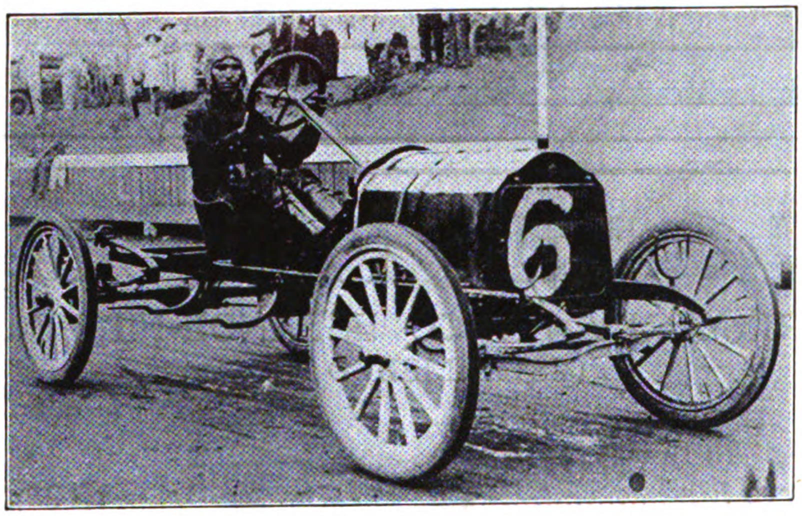

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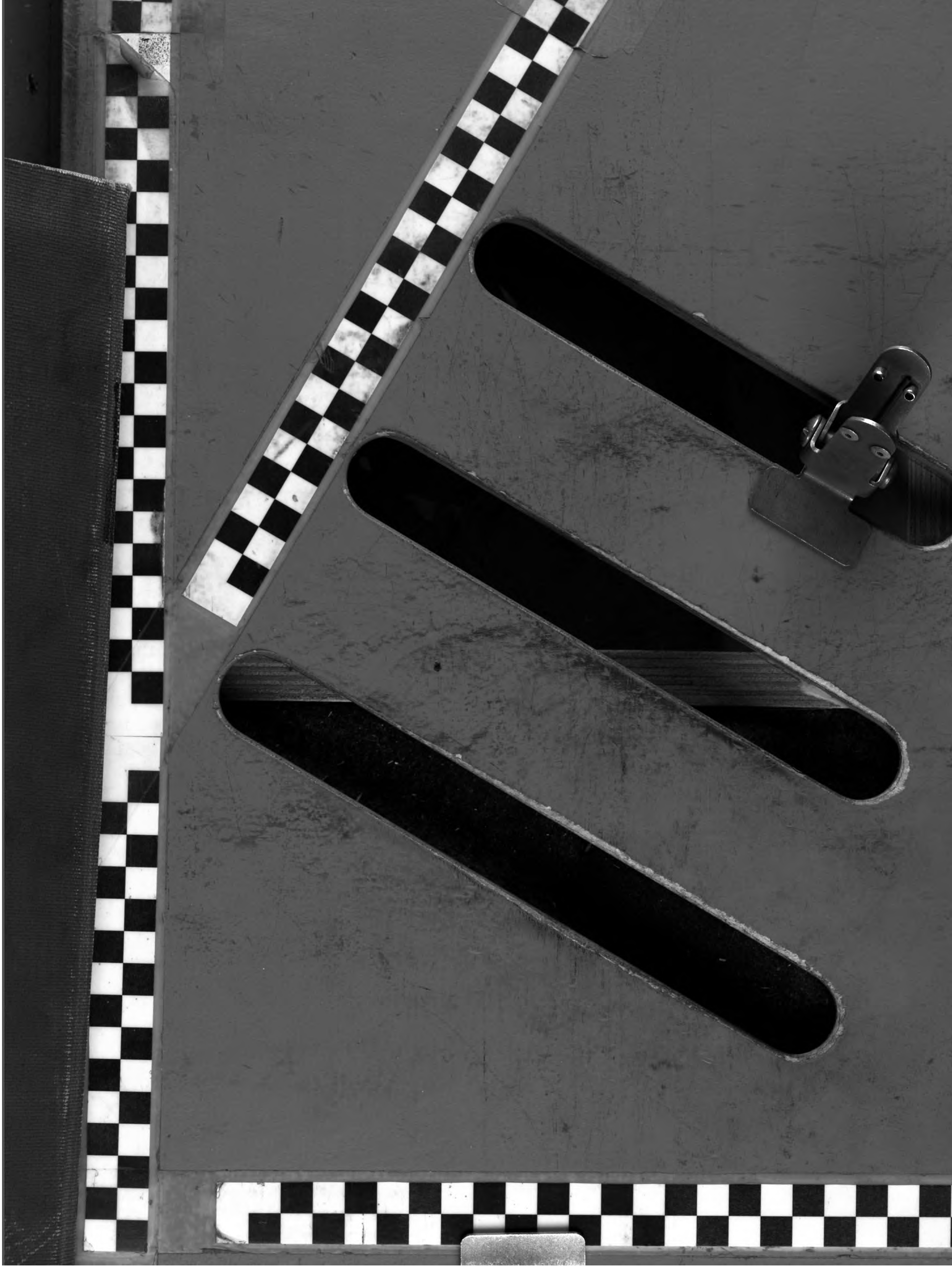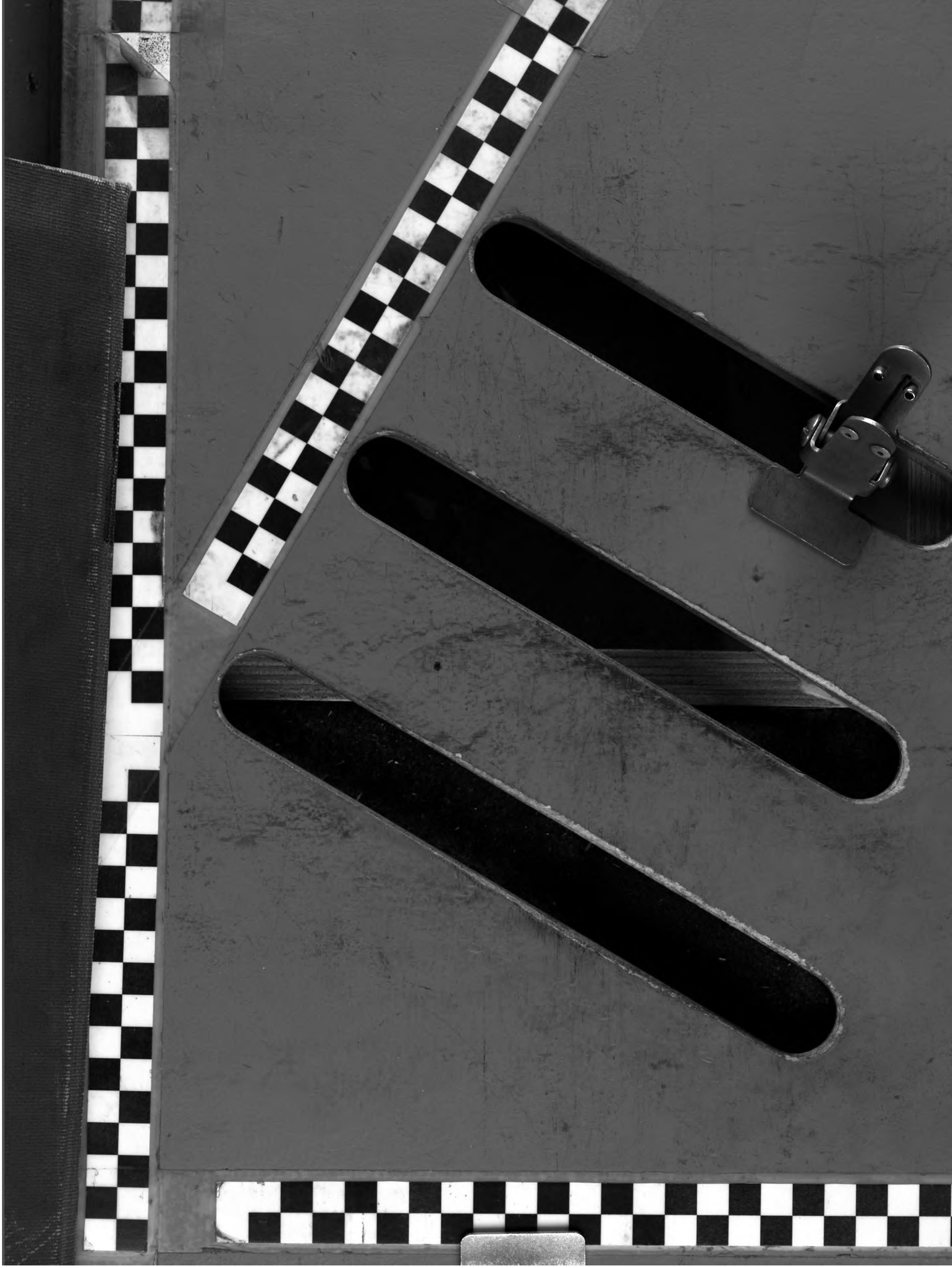
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